~~OA-2547~~ 1992-03-08-OA-FEA-Kamehame 990' Water Reservoir

APPLICATION FOR

CONSERVATION DISTRICT USE PERMIT

KAMEHAME 990' WATER RESERVOIR

Hawaii Kai, Oahu, Hawaii

January 1992

PACIFIC PLANNING & ENGINEERING, INC

ALSTON
HUNT
FLOYD
& ING

Attorneys at Law,
A Law Corporation

Paul Alston
Ellen Godbey Carson
Shelby Anne Floyd
Peter C. Hsieh
William S. Hunt
Louise K.Y. Ing
Everett S. Kaneshige
Hyo-Jin Jeni Lee
Mei Nakamoto
Bruce S. Nobonkawa
Elizabeth A. Sullivan
Mary L. Takeuchi
Theodore D.C. Young
(Licensed in California only)

Of Counsel
Sharon A. Merkle

HAND DELIVERED

Office of Conservation and Environmental Affairs
Department of Land and Natural Resources
1151 Punchbowl Street, Room 131
Honolulu, Hawaii 96813

RE: Conservation District Use Application for
Tax Map Key No. 3-9-10:1

Ladies and Gentlemen:

Enclosed please find eighteen (18) copies of a Conservation District Use Application for the construction of the Kamehame 990' Water Reservoir at Hawaii Kai, Oahu, Hawaii. All requisite attachments, including the environmental assessment, are included therein.

In addition, a check in the amount of $50.00 is enclosed for the filing fee to process this application. Please note that a public hearing fee is not included, since the proposed use is for utility purposes.

Any further communication or correspondence may be sent to the undersigned, as the attorney for the applicant.

Thank you for your consideration in this matter.

Very truly yours,

Everett S. Kaneshige

EVERETT S. KANESHIGE
ESK:cm
Encl.

cc: Client
A. Chong, Pacific Planning and Engineering, Inc.

Suite 1800, Pacific Tower, 1001 Bishop Street
P.O. Box 2281, Honolulu, Hawaii 96804
Telephone: (808) 524-1800 Fax: (808) 524-4591

CONSERVATION DISTRICT USE PERMIT APPLICATION

AND

ENVIRONMENTAL ASSESSMENT

KAMEHAME 990' WATER RESERVOIR

Hawaii Kai, Oahu, Hawaii

January 1992

Applicant:
Hawaii Kai Development Company
Hawaii Kai Corporate Plaza, Suite 300
6600 Kalanianaole Highway
Honolulu, Hawaii 96825

Prepared By:
Pacific Planning & Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

KAMEHAME 990' WATER RESERVOIR

CONSERVATION DISTRICT USE PERMIT APPLICATION

LIST OF DOCUMENTS

APPLICATION

Master Application Form

Attachments to Master Application Form

Information Required For All Uses

Information Required For Conditional Uses

Document For Publication In the OEQC Bulletin

EXHIBITS

A. Kamehame 990' Water Reservoir Environmental Assessment

B. Real Property Mortgage

February 1983

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 621
HONOLULU, HAWAII 96809

FOR DLNR USE ONLY
Reviewed by
Date
Accepted by
Date
Docket/File No.
180-Day Exp.
EIS Required
PH Required
Board Approved
Disapproved
Well No.

DEPARTMENT MASTER APPLICATION FORM

(Print or Type)

I. LANDOWNER/WATER SOURCE OWNER (If State land, to be filled in by Government Agency in control of property)

Name: Trustees of the Estate of Bernice Pauahi Bishop
Address: 567 S. King Street, #200
Honolulu, HI 96813
Telephone No. 523-6200
SIGNATURE: Paul Yamamoto
Date: 12/22/91

II. APPLICANT (Water Use, omit if applicant is landowner)

Name: Hawaii Kai Development Company
Address: 6600 Kalanianaole Hwy, Suite 300
Honolulu, HI 96825
Telephone No. 395-2331
Interest in Property: Developer
See Exhibit B - Real Property Mortgage
(Indicate interest in property; submit written evidence of this interest)
*SIGNATURE: [signature] V.P.
Date: 12-20-91

III. TYPE OF PERMIT(S) APPLYING FOR

( ) A. State Lands
(X) B. Conservation District Use
(.) C. Withdraw Water From A Ground Water Control Area
( ) D. Supply Water From A Ground Water Control Area
( ) E. Well Drilling/Modification

*If for a Corporation, Partnership, Agency or Organization, must be signed by an authorized officer.

IV. WELL OR LAND PARCEL LOCATION REQUESTED

District: Hawaii Kai
Island: Oahu
County: Honolulu
Tax Map Key: 3-9-10: Portion 1
Area of Parcel: 0.5 Acres (Indicate in acres or sq. ft.)
Term (if lease): Not applicable

V. Environmental Requirements

Pursuant to Chapter 343, Hawaii Revised Statutes, and in accordance with Title 11; Chapter 200, Environmental Impact Statement Rules for applicant actions, an Environmental assessment of the proposed use must be attached. the Environmental assessment shall include, but not be limited to the following:

(1) Identification of applicant or proposing agency;

(2) Identification of approving agency, if applicable;

Environmental Assessment is Attached as Exhibit A

(3) Identification of agencies consulted in making assessment;

(4) General description of the action's technical, economic, social, and environmental characteristics;

(5) Summary description of the affected environment, including suitable and adequate location and site maps;

(6) Identification and summary of major impacts and alternatives considered, if any;

(7) Proposed mitigation measures, if any;

(8) Determination;

(9) Findings and reasons supporting determination; and

(10) Agencies to be consulted in the preparation of the EIS, if applicable.

VI. Summary of Proposed Use (what is proposed)

See Attachments to Master Application Form.

INFORMATION REQUIRED FOR ALL USES

I. Description of Parcel

A. Existing structures/Use. (Attach description or map).

B. Existing utilities. (If available, indicate size and location on map. Include electricity, water, telephone, drainage, and sewarage).

C. Existing access. (Provide map showing roadways, trails, if any. Give street name. Indicate width, type of paving and ownership).

D. Vegetation. (Describe or provide map showing location and types of vegetation. Indicate if rare native plants are present).

E. Topography; if ocean area, give depths. (Submit contour maps for ocean areas and areas where slopes are 40% or more. Contour maps will also be required for uses involving tall structures, gravity flow and other special cases).

F. If shoreline area, describe shoreline. (Indicate if shoreline is sandy, muddy, rocky, etc. Indicate cliffs, reefs, or other features such as access to shoreline).

G. Existing covenants, easements, restrictions. (If State lands, indicate present encumbrances.)

H. Historic sites affected. (If applicable, attach map and descriptions).

II. Description: Describe the activity proposed, its purpose and all operations to be conducted. (Use additional sheets as necessary).

III. Commencement Date: December 1992

Completion Date: Mid 1993

IV. TYPE OF USE REQUESTED (Mark where appropriate) (Please refer to Title 13, Chapter 2)

1. Permitted Use (exception occasional use);
DLNR Title 13, Chapter 2, Section _____; Subzone _____.

2. Accessory Use (accessory to a permitted use):
DLNR Title 13, Chapter 2, Section _____; Subzone _____.

3. Occasional Use: Subzone _____.

4. Temporary Variance: Subzone _____.

5. Conditional Use: Subzone G.
Water Reservoir

Area of Proposed Use Approximately 0.5 acres
(Indicate in acres or sq. ft.)

Name & Distance of Nearest Town or Landmark
Koko Head Crater

Boundary Interpretation (If the area is within 40 feet of the boundary of the Conservation District, include map showing interpretation of the boundary by the State Land Use Commission).

Conservation District Subzone General (G) Subzone
County General Plan Designation P-1 Restricted Preservation District

V. FILING FEE

1. Enclose $50.00. All fees shall be in the form of cash, certified or cashier's check, and payable to the State of Hawaii.

2. If use is commercial, as defined, submit additional public hearing fee of $50.00.

INFORMATION REQUIRED FOR CONDITIONAL USE ONLY

I. Plans: (All plans should include north arrow and graphic scale).

A. Area Plan: Area plan should include but not be limited to relationship of proposed uses to existing and future uses in abutting parcels; identification of major existing facilities; names and addresses of adjacent property owners.

B. Site Plan: Site plan (maps) should include, but not be limited to, dimensions and shape of lot; metes and bounds, including easements and their use; existing features, including vegetation, water area, roads, and utilities.

C. Construction Plan: Construction plans should include, but not be limited to, existing and proposed changes in contours; all buildings and structures with indicated use and critical dimensions (including floor plans); open space and recreation areas; landscaping, including buffers; roadways, including widths; offstreet parking area; existing and proposed drainage; proposed utilities and other improvements; revegetation plans; drainage plans including erosion sedimentation controls; and grading, trenching, filling, dredging or soil disposal.

D. Maintenance Plans: For all uses involving power transmission, fuel lines, drainage systems, unmanned communication facilities and roadways not maintained by a public agency, plans for maintenance shall be included.

E. Management Plans: For any appropriate use of animal, plant, or mineral resources, management plans are required.

F. Historic or Archaeological Site Plan: Where there exists historic or archaeological sites on the State or Federal Register, a plan must be submitted including a survey of the site(s); significant features; protection, salvage, or restoration plans.

II. Subzone Objective: Demonstrate that the intended use is consistent with the objective of the subject Conservation District Subzone (as stated in Title 13, Chapter 2).

ATTACHMENTS TO

DEPARTMENT MASTER APPLICATION FORM

Attachments To

Conservation District Use Permit Application
for
Kamehame 990' Water Reservoir

DEPARTMENT MASTER APPLICATION FORM

VI. Summary of Proposed Use

The Hawaii Kai Development Company is proposing to construct the Kamehame 990' Water Reservoir on Kamehame Ridge (the "project"). The water reservoir's capacity of 0.1 million gallons (mg) will provide a reliable supply of water for a planned Kamehame Ridge Unit III subdivision (the "subdivision").

The project will be constructed on a one-half acre project site. The proposed water reservoir tank will have a spillway elevation of 990 feet and finished floor elevation of 975 feet. Two new transmission mains will be added to the existing water system as part of this project. One transmission main will be used to provide water service to the subdivision while the second transmission main will supply water to the proposed reservoir from the existing Na Pali Haweo 820' reservoir.

An access road will be constructed to provide vehicular access to the project from a private road leading to the top of the ridge from the subdivision. Other accessory facilities include an instrument house, fencing, and drainage system for water runoff and erosion control on the project site. A landscaping plan has also been developed to minimize the visual impact of the project and prevent soil erosion.

The project is needed to provide an adequate and reliable supply of water for future residents of the subdivision. The project would meet the Board of Water Supply's (BWS) fire flow protection criterion, and gravity flow requirement ensuring system reliability. The project is also consistent with a Water Master Plan for the subdivision and other existing subdivisions on Kamehame Ridge which was previously reviewed and approved by the Board of Water Supply. A copy of this letter is included in the Environmental Assessment report attached as Exhibit A.

The subdivision is planned to be developed on a 13.8 acre site located above (mauka) Phase II of the Na Pali Haweo subdivision development on Kamehame Ridge. The subdivision is expected to include approximately 33 fee simple house lots ranging in size from 10,000 to 55,000 square feet. Using criteria from the BWS's Water System Standards, a water reservoir capacity of at least 82,080 gallons is required to service the subdivision. The project would have a reservoir capacity of 100,000 gallons which exceeds the required capacity.

Construction of the reservoir project is planned to commence in December 1992, and will take approximately five to seven months to complete. The construction cost of the project is estimated to be $608,000. Upon completion, Bishop Estate will dedicate the project to the BWS. The BWS will be responsible for the reservoir and all associated facilities along with the operation and maintenance of the project.

INFORMATION REQUIRED FOR ALL USES

I. Description of Parcel

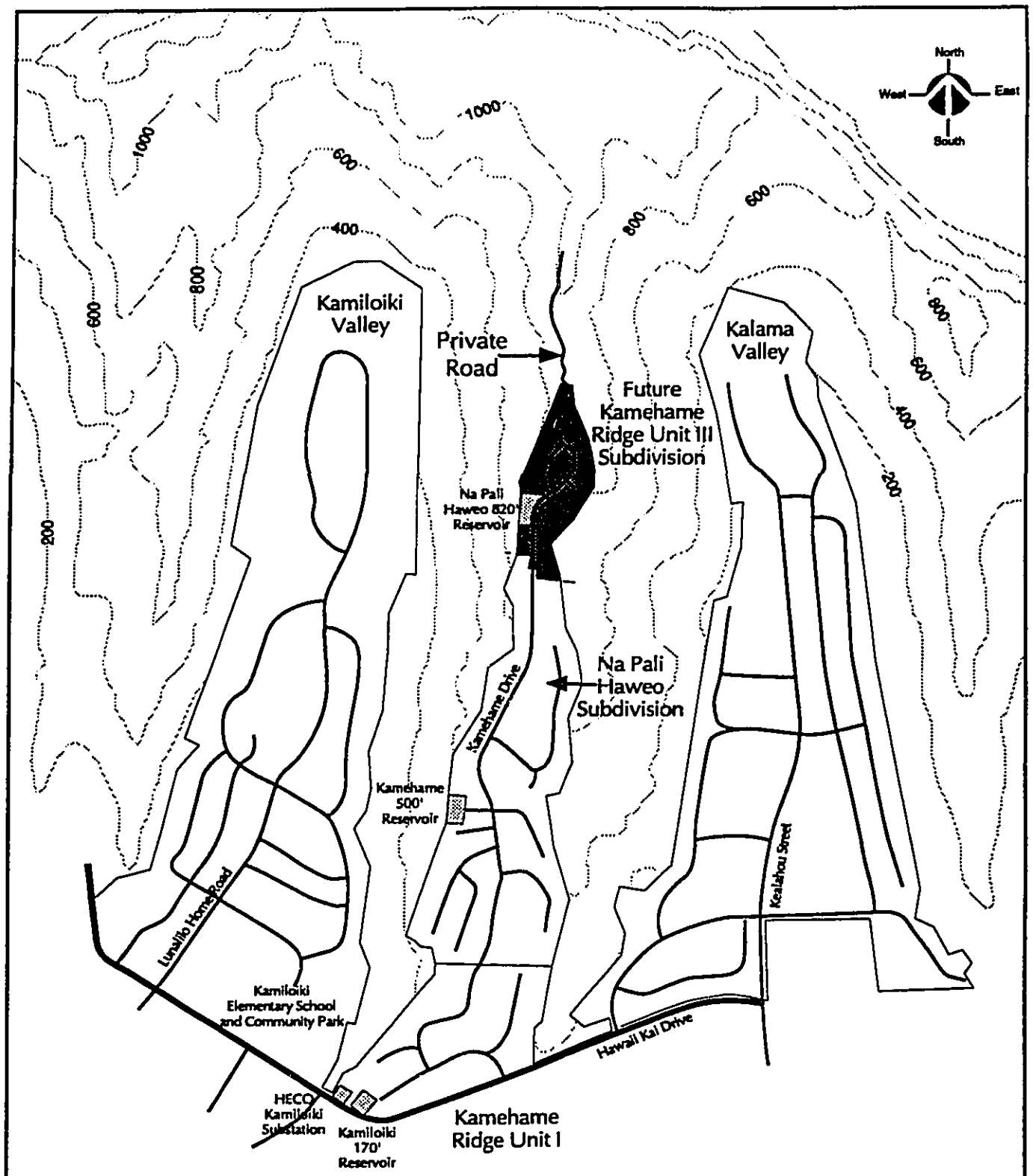
A. Existing Structures/Use

The project will be constructed on a site measuring approximately one-half acre. This site is identified as a portion of Tax Map Key 3-9-10:1 which is located near the top of Kamehame Ridge about 975 feet above sea level. Figure 1 shows existing land uses in the vicinity of the project site.

The project site is currently undeveloped land having characteristics associated with the existing mountainous terrain. The site was determined to have an Overall Productivity Rating of 'E' according to the Land Study Bureau's Detailed Land Classification - Island Of Oahu, and does not sustain any agricultural uses. It is predominantly vegetated with shrubby koa-haole, kiawe trees, and grasses.

The project site is situated on Kamehame Ridge above the residential subdivisions of Kamiloiki Valley to the west (ewa) and Kalama Valley to the east (Makapuu). These subdivisions consist primarily of single-family residences, along with a few parks (Kamiloiki Neighborhood Park, Kamiloiki Community Park and Kamiloiki Community Center) and Kamiloiki Elementary School.

The subdivision site is located south (makai) of the project site. Further south are the Na Pali Haweo and Kamehame Ridge Units I and II subdivisions consisting of single-family residential units, and a small neighborhood park located in the Na Pali Haweo subdivision.



PACIFIC PLANNING & ENGINEERING, INC	VICINITY MAP	Figure 1

B. Existing Utilities

Hawaiian Electric Company's Kamiloiki Substation is located at the foot of Kamehame Ridge adjacent to Hawaii Kai Drive. An existing sub-transmission line located below the reservoir site runs along the western (ewa) slope of the ridge and feeds into this substation.

There are three existing water reservoirs located on Kamehame Ridge which supply the water needs of existing Kamehame Ridge residential subdivisions, as well as other residences in the Hawaii Kai area. These reservoirs are the Na Pali Haweo 820' (0.2 mg) reservoir, Kamehame 500' (1.5 mg) reservoir and the Kamiloiki 170' (2 mg) reservoir.

C. Existing Access

Existing vehicular access to the project site is from a private road leading to the top of Kamehame Ridge. This private road begins from Kamehame Drive which currently provides vehicular access to Units I and II of the existing Na Pali Haweo subdivision. The private road is closed off to the public via a chained gate. Only those individuals having authorization to access facilities located on top of the ridge are permitted access through this gate.

Kamehame Drive is a two-laned roadway connecting to Hawaii Kai Drive via Maunanani Street, and is the primary road providing vehicular access to residential units located on Kamehame Ridge. Kamehame Drive will be extended to provide vehicular access for the subdivision.

D. Vegetation

Vegetation on Kamehame Ridge consists principally of low (3 to 7 feet), windswept koa-haole shrubland. Scattered throughout this koa-haole shrubland are kiawe trees, klu shrubs and Christmas berry. The most abundant grass is Guinea grass which forms a dense ground cover. Other grass types found were pitted beardgrass, sour grass, and natal redtop.

Along the existing private road, and on rocky outcroppings, annual weedy species and other grass species are more common. These include beggar's tick, virgate mimosa, pitted beardgrass, natal redtop, partridge pea, fuzzy rattlepod, and swollen finger grass.

The vegetation around the proposed water reservoir site is dominated primarily by introduced or alien species such as koa-haole and Guinea grass. Scattered clumps of native plant species are present on the project site. These natives occur widely throughout the Hawaiian Islands in similar habitats. None of these native species are officially listed threatened and endangered species (U. S. Fish and Wildlife Service 1989); nor are any of them proposed or candidate for such status (U.S. Fish and Wildlife Service 1990). A botanical study is included in the Environmental Assessment report attached as Exhibit A.

E. Topography

Kamehame Ridge is composed of seaward dipping (about 10 degrees) pahoehoe basalt flows with a few (less than 10 percent of total volume) aa basalt flows. The topography of Kamehame Ridge is irregular with isolated knolls and small erosion gullies extending throughout the area. Height elevations on Kamehame Ridge where the reservoir and related facilities are to be sited range from approximately 800 to 1,000 feet above sea level. The area in the vicinity of the project site is undeveloped mountainous land with generally steep slopes (greater than 30 percent).

The project site's soil characteristic is classified as Rock Land which includes areas where exposed rock covers 25 to 90 percent of the surface. Rock outcrops primarily composed of basalt and andesite along with very shallow soils are the predominant characteristics associated with Rock Land. The soil is composed of variable clay properties, is well-drained, and is not suited to machine tillability due to an abundance of rock.

F. Shoreline Area

The project site is not located in a shoreline area.

G. Existing Covenants, Easements, Restrictions

The project is consistent with all existing covenants, and restrictions. Bishop Estate currently owns the land located at the project site. They have agreed to dedicate ownership and management of the project to the City and County of Honolulu Board of Water Supply upon completion.

H. Historic Sites Affected

Field surveys conducted by Cultural Surveys Hawaii determined that no archaeological sites were observed at the project site. There were no overhangs of a size sufficient for habitation observed. The terrain is mostly crumbly, weathered basalt which appears to be subject to periodic slope wash during heavy rains. As a result, these terrain factors and observed absence of suitable overhangs suggest a very low probability of any sites in the project area. The archaeological study is included in the Environmental Assessment report attached as Exhibit A.

Two inventory level surveys, prepared by Kanalei Shun of Archaeological Associates Oceania (Shun 1988 and 1990) for the Kamehame Ridge Unit II Subdivision (1988) and for a Na Pali Haweo Transmission Line (1990), determined that no historical sites of any kind were identified in the surveyed areas on Kamehame Ridge. Other previous archaeological research also indicates an absence of archaeological sites along the higher elevation slopes of ridges in the Maunalua area. Though there have been reported rock shelter sites at Kuliouou (Emory and Sinoto 1961) and burial caves on Kaluanui Ridge (Sites 50-10-15-2902 and 2908), these were found at lower elevations (60 to 100 feet) along the ridge, and were located closer to the ocean than the proposed project site.

II. Description of Proposed Activity

A. Description of Reservoir Tank and Transmission Mains

The proposed water reservoir will have a capacity of 0.1 millio gallons which exceeds the BWS's reservoir capacity requirements for the subdivision. The reservoir tank will have a finished floor elevation of 975 feet and a spillway elevation of 990 feet. The reinforced concrete tank will measure approximately 17 feet in height with a diameter of approximately 38 feet when completed. It will be painted a neutral earth-tone color to blend in with the surrounding landscape. Figure 2 shows a site plan for the project.

Two new transmission mains will be added to the existing water system to provide water service to the subdivision. The routing alignment of these transmission mains are shown on the site plan (Figure 2). A 12-inch transmission main will generally be routed along the existing private road from the proposed reservoir site to the subdivision site. This transmission main will be used to provide water service to the homes of the subdivision.

A second 12-inch transmission main will be installed to connect the Na Pali Haweo 820' reservoir with the project. This transmission main will be used to supply water for the project's reservoir tank via a booster added to the Na Pali Haweo 820' reservoir. It will also be routed along Kamehame Drive and the private road leading to the project site.

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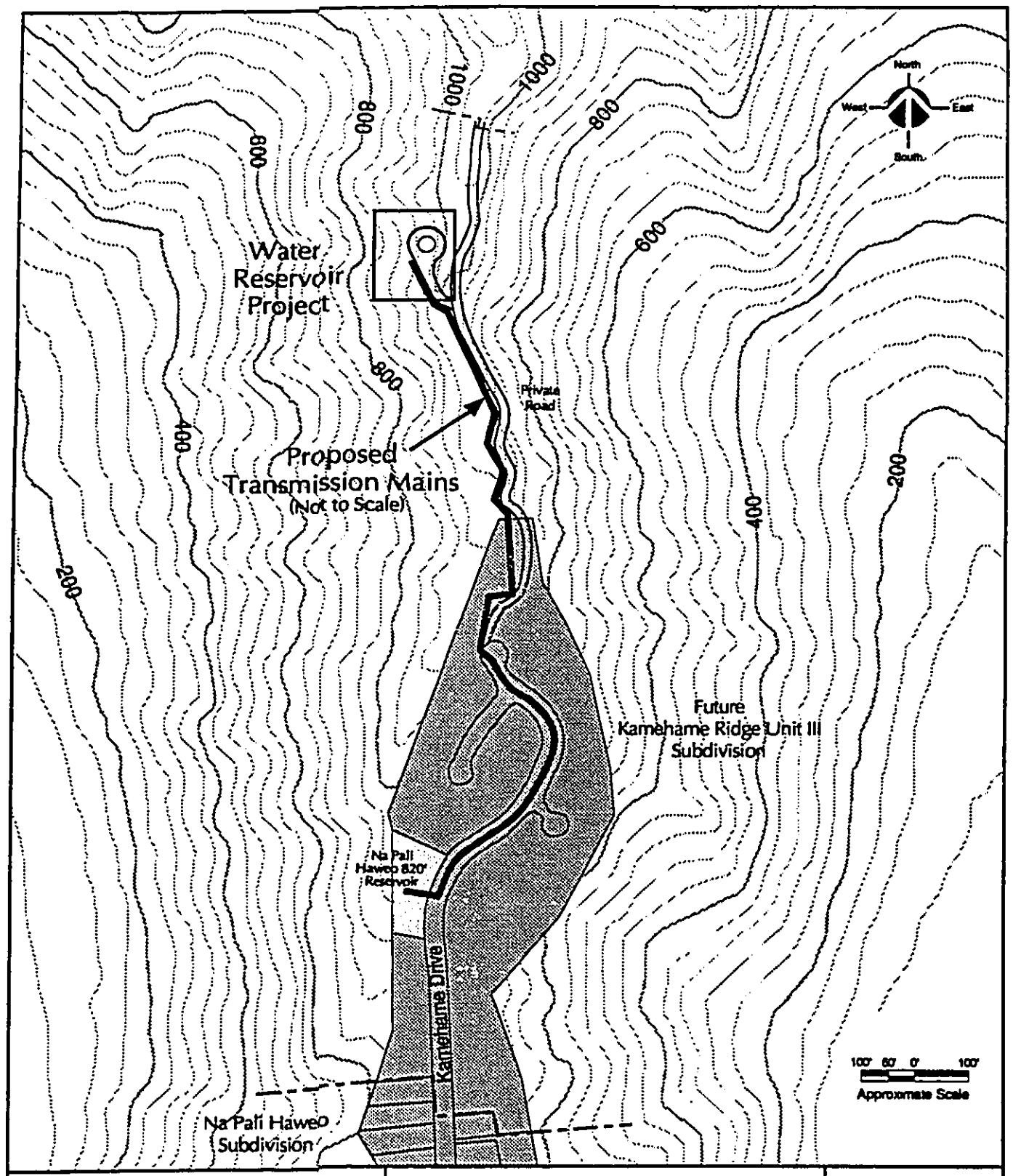


PACIFIC PLANNING & ENGINEERING, INC

PROJECT SITE PLAN

Figure 2

B. Description of Accessory Facilities

An access road, approximately 80 feet in length, will be constructed to provide vehicular access from the existing private road to the project's facilities. This road will connect with the existing private road at a point approximately 1,000 feet from the subdivision site. The road will be 14 feet wide, and vehicular access will be controlled by a locked chain-link security gate.

An instrument house will be constructed to accommodate sensing instruments and other equipment for regulating reservoir water levels. The 8-foot high instrument house will have a floor area of approximately 48 square feet, and will be constructed primarily of concrete block.

A 15-foot high reinforced concrete retaining wall will be constructed east of the reservoir tank. This wall will be semi-circular in shape and approximately 90 feet in length. A drainage system will be constructed for water runoff and erosion control on the project site in conformance with BWS and City and County Department of Public Works standards. Approximately 3,000 linear feet of fencing, 6-feet in height, will enclose the project site and access road.

A landscaping plan has also been developed for the project to minimize the visual impact of the reservoir facility and reduce soil erosion.

III. Commencement and Completion Dates

Commencement Date: December 1992

Completion Date: Mid 1993

IV. Type of Use Requested

A. Type of Use:

Conditional Use: Subzone G
0.1 mg Water Reservoir

B. Area of Proposed Use: Approximately 0.5 acre

C. Name and Distance of Nearest Town or Landmark:

The nearest landmark is Koko Head Crater located to the east of Kamehame Ridge. The nearest residential subdivisions to the project site are the Na Pali Haweo and Kamehame Ridge Unit I subdivisions. Located at the foot of Kamehame Ridge below the water reservoir project site is the Kamiloiki Valley subdivision.

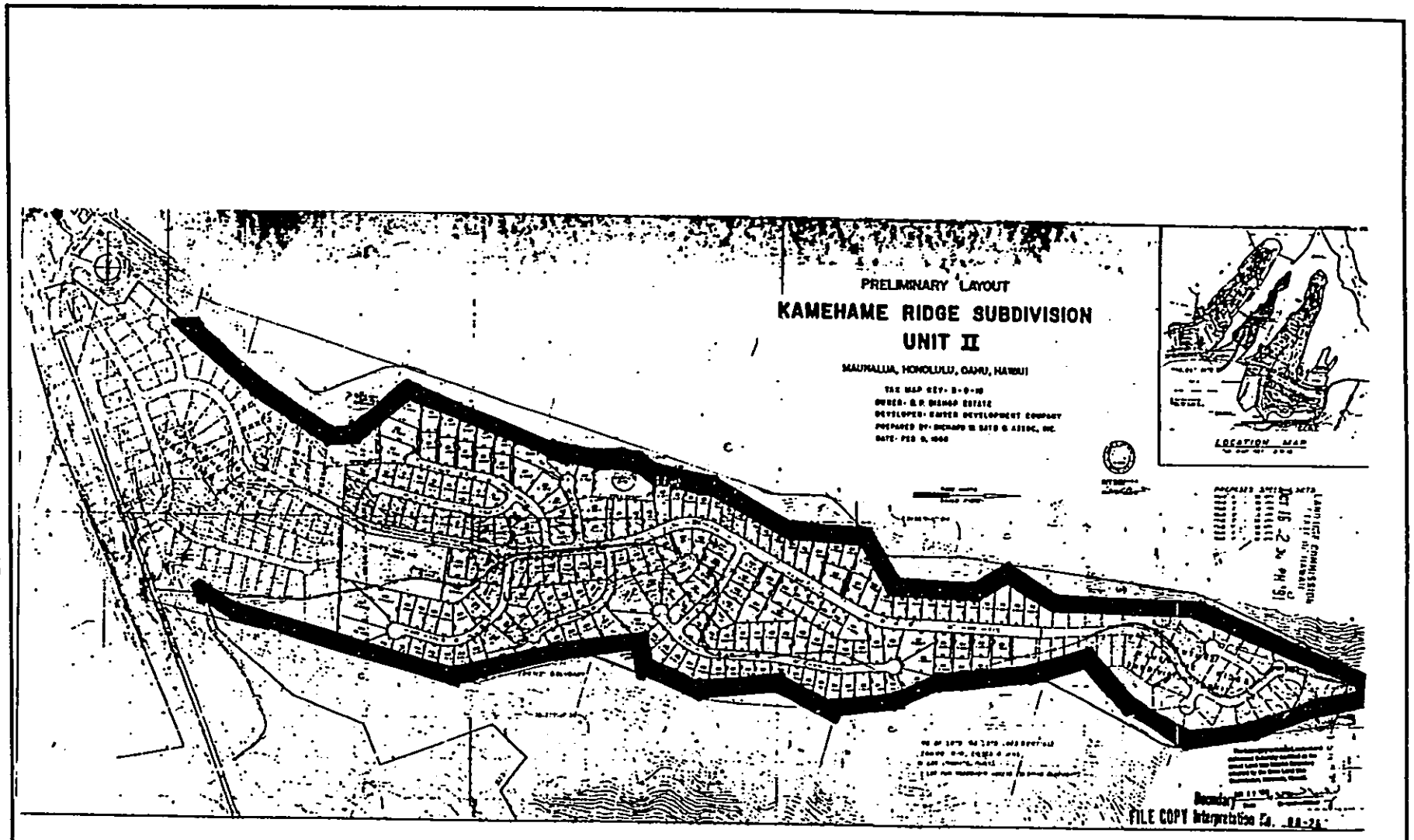
D. Boundary Interpretation:

Figures 3 and 4 show Boundary Interpretation Numbers 88-26 and 91-53, respectively from the State Land Use Commission for the project site.

E. Conservation District Subzone: General (G) Subzone

F. County General Plan Designation:

According to the City and County of Honolulu, Department of Land Utilization's Zoning Map Number 1 (Hawaii Kai), the project site is currently zoned P-1 Restricted Preservation District. All proposed land uses for areas zoned P-1 fall under the jurisdiction of the Department of Land and Natural Resources.

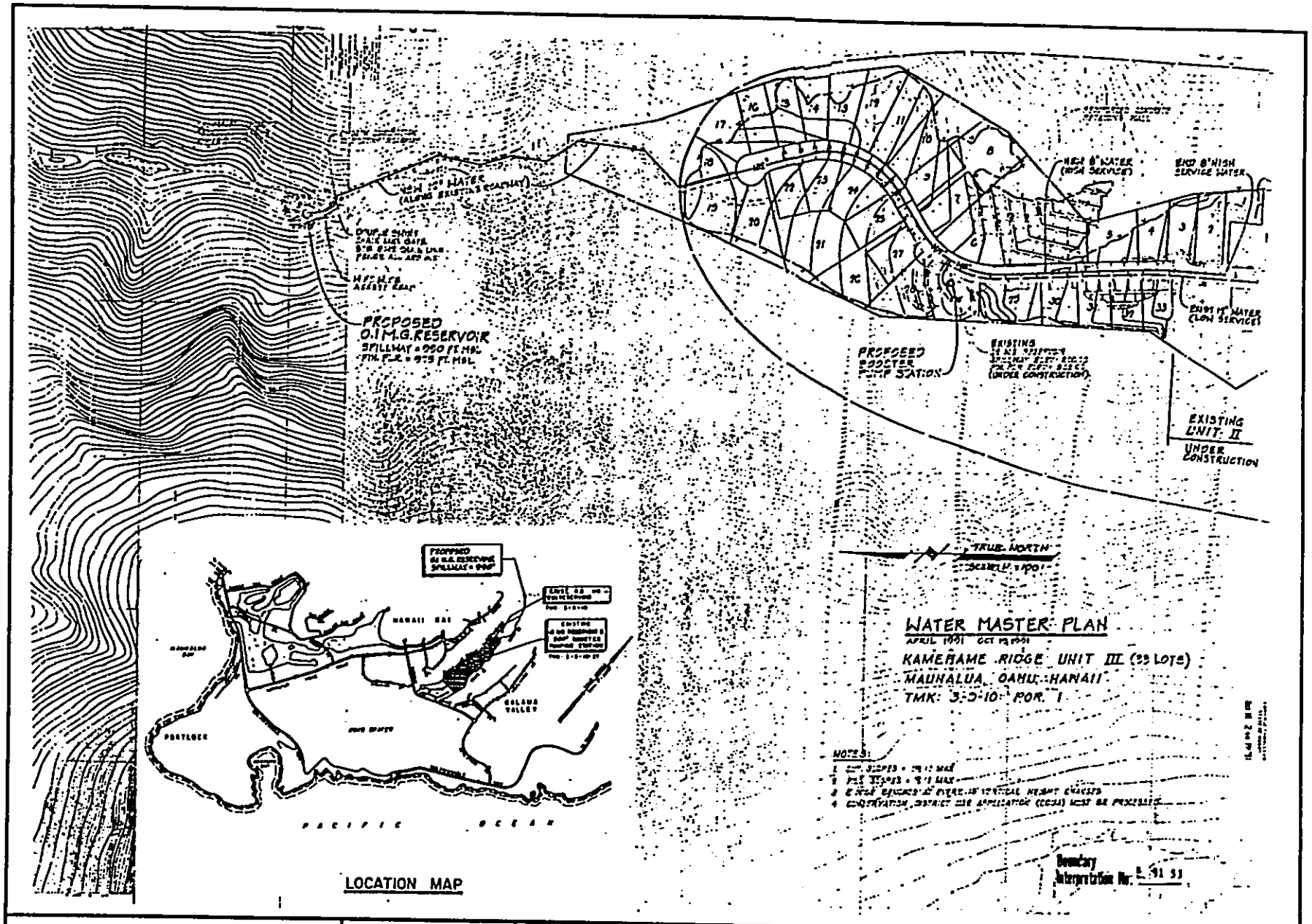


PACIFIC PLANNING & ENGINEERING, INC

Source: State Land Use Commission

State Land Use Commission
Boundary Interpretation Map No. 88-26

Figure 3



PACIFIC PLANNING & ENGINEERING, INC

Source: State Land Use Commission

State Land Use Commission
Boundary Interpretation Map No. 91-53

Figure 4

INFORMATION REQUIRED FOR CONDITIONAL USE ONLY

I Plans

A. Area Plan

Bishop Estate is the owner of the lands at the project site as well as in the immediate area adjacent to the project site. Bishop Estate is also the owner of the fee interest in the subdivision. Hawaii Kai Development Company is the owner of Units I and II of the Na Pali Haweo subdivision. Individual Unit I and II house lots are currently for sale, and some have been conveyed to individual owners. The area plan for the project is shown on Figure 5.

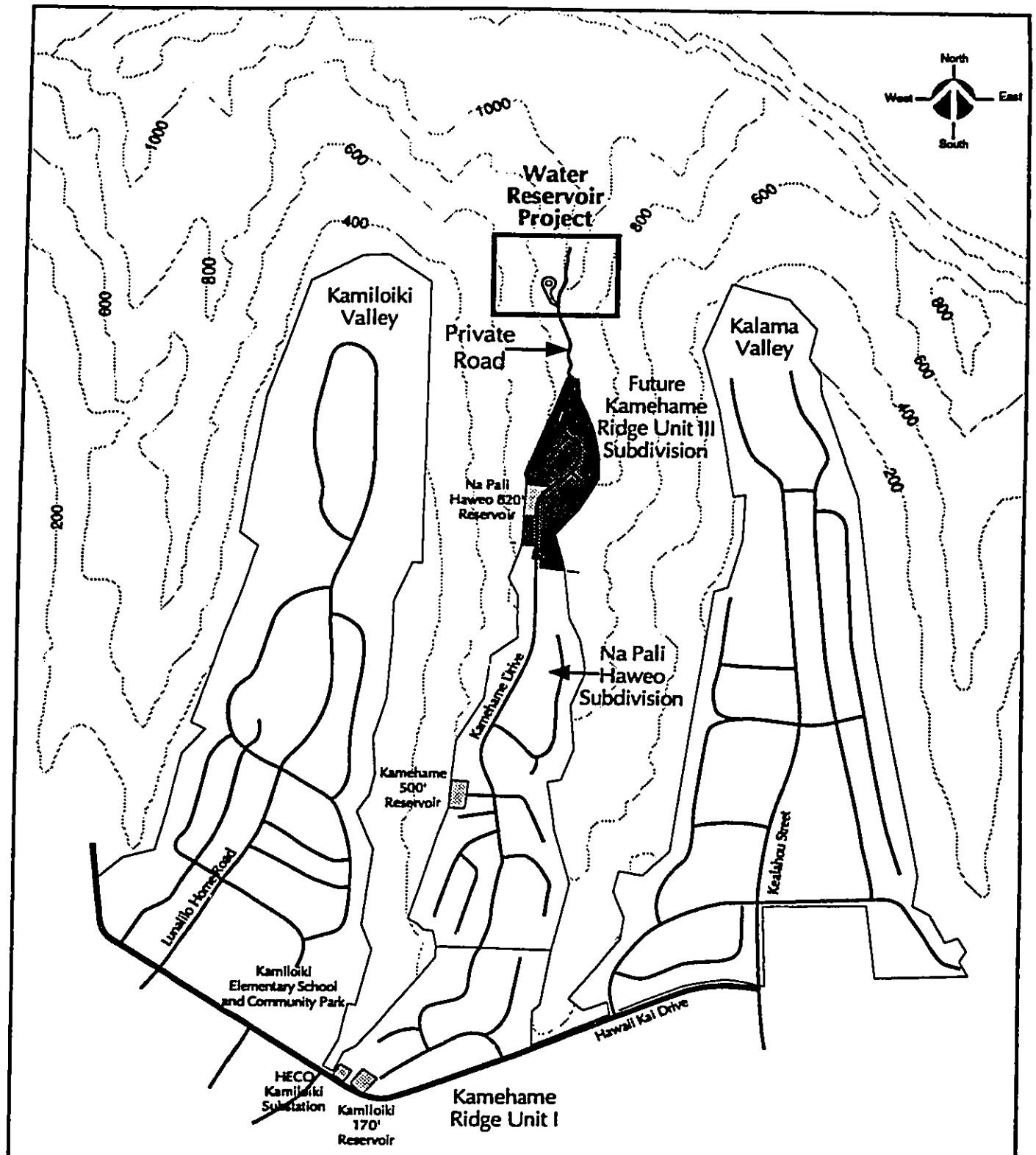
B. Site Plan

The site plan for the project was previously shown on Figure 2.

C. Construction Plan

The project will require about six full-time construction workers along with approximately 10 dump-trucks. A loader, bulldozer and backhoe will also be required. A staging site for the storage of construction materials and equipment is expected to be located near the project site.

Approximately 3,000 cubic yards of material will be excavated from the project site, and used as fill for the subdivision site and road construction. A backhoe will be used for excavation and to install the transmission mains.

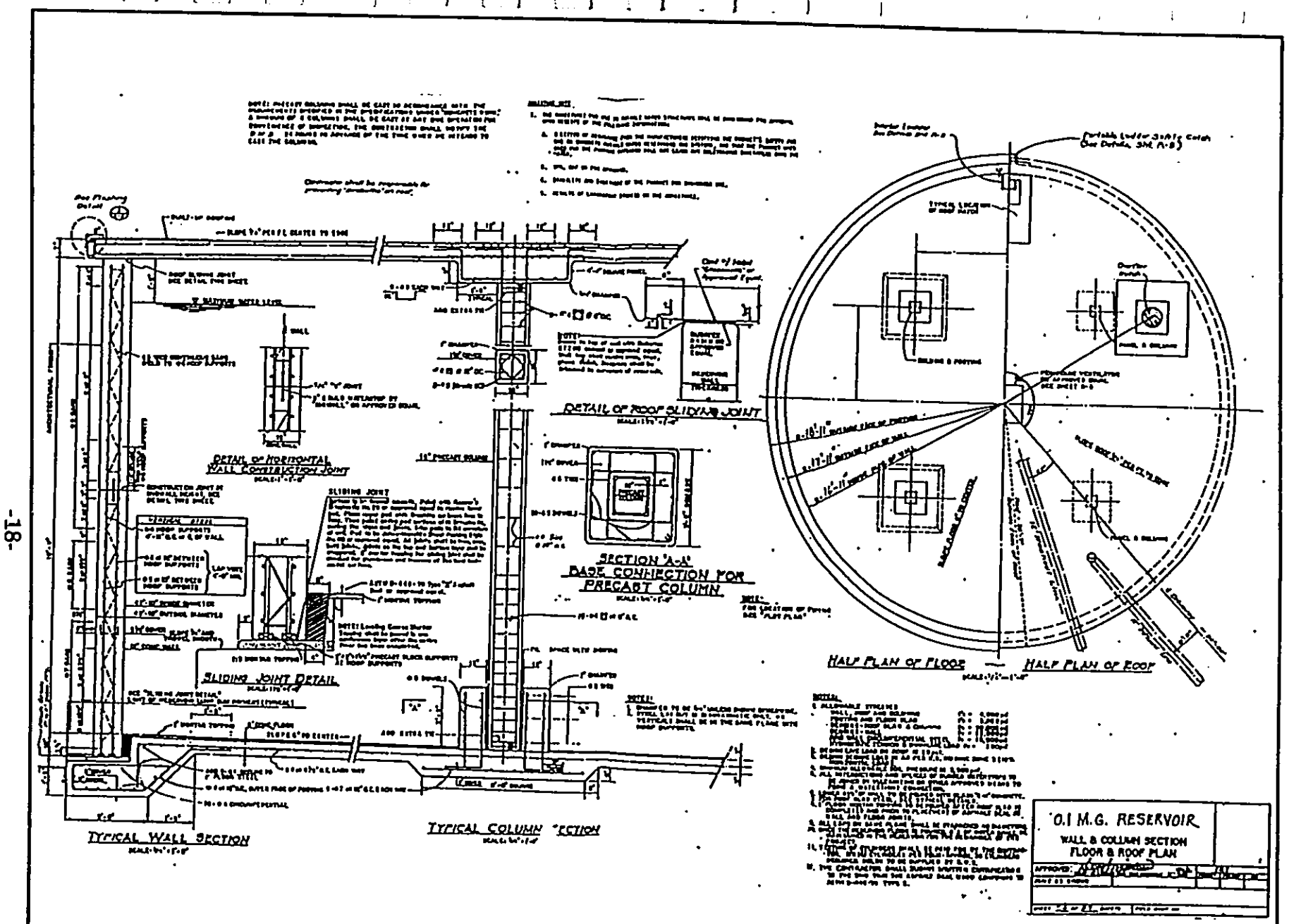


PACIFIC PLANNING & ENGINEERING, INC	AREA PLAN	Figure 5

Grading and excavation activities are expected to occur for approximately one month, while construction of the reservoir, facilities and transmission mains are expected to last from four to six months. Construction of the reservoir facility will begin once excavation work is completed. A preliminary construction plan for the reservoir facility is shown on Figure 6. The transmission mains will be installed underground just prior to the paving of the access road. Throughout all phases of the project, a water truck will be used to minimize dust resulting from construction activities.

A drainage system will be provided for water runoff and erosion control on the reservoir site. A study will be undertaken during the engineering design phase of the project to determine the most appropriate type of drainage system. The drainage system will be constructed in conformance with BWS and City and County Department of Public Works standards.

A landscaping plan has been developed for the reservoir project to minimize the visual impact of the reservoir facility and to minimize soil erosion. This landscaping plan is shown on Figure 7. Graded areas will be roughened before top soil is added. Seeds of kiawe and ryegrass will then be scattered on the soil, and an erosion-control fabric applied. Lastly, the slopes will be hydro-mulched to promote vegetative growth. The landscaping and irrigation work should take approximately two weeks to install, and will conform to BWS standards.

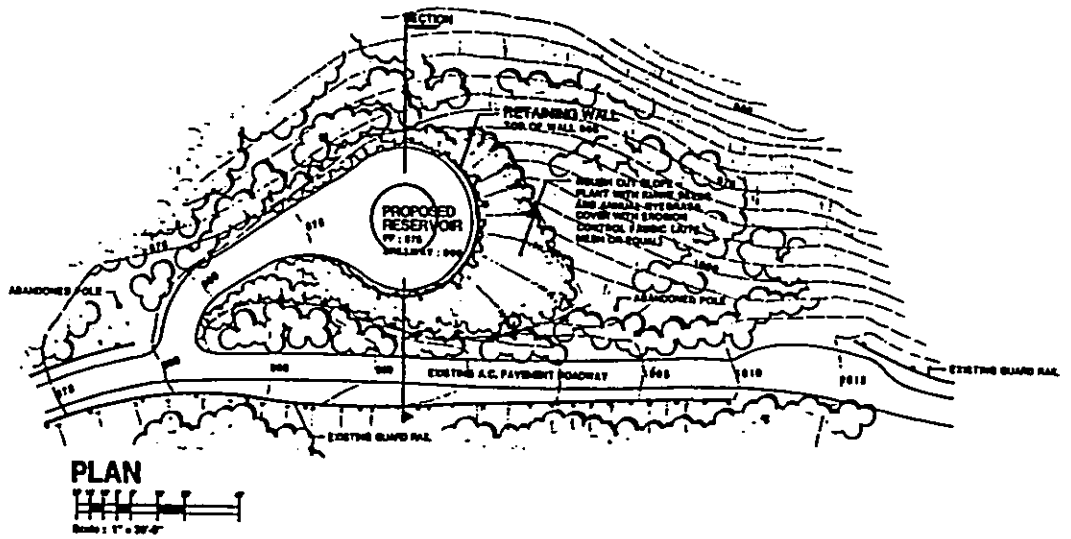


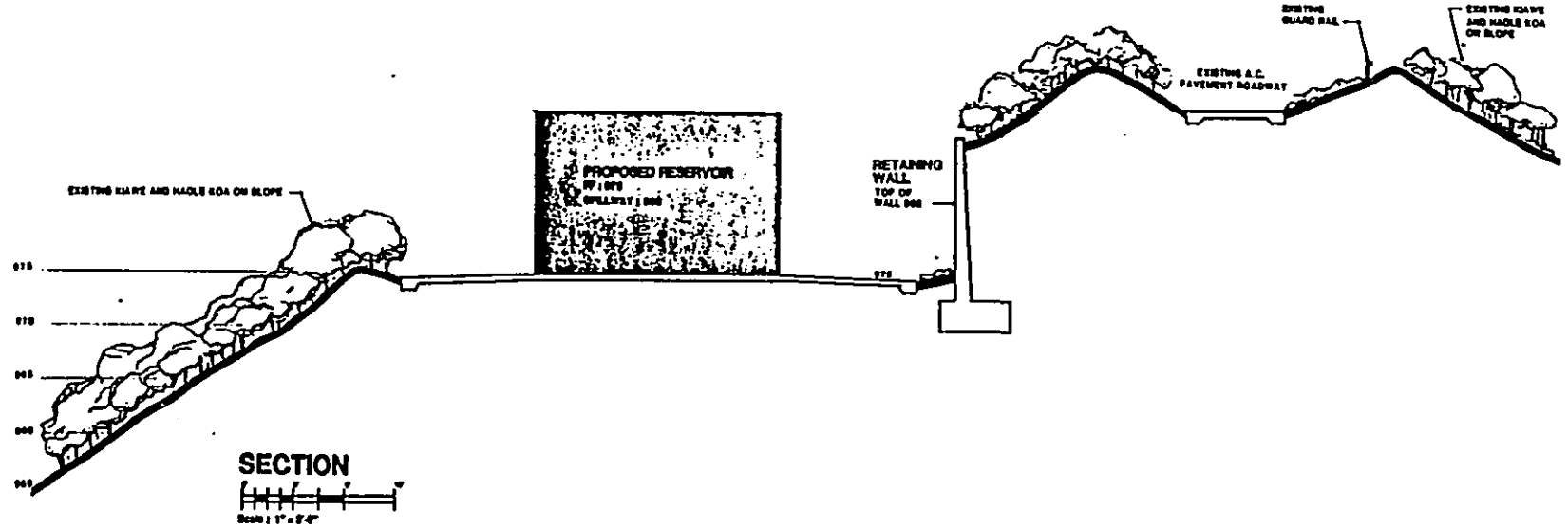
PACIFIC PLANNING & ENGINEERING, INC

Source: Richard Sato & Associates

PRELIMINARY CONSTRUCTION PLAN

Figure 6





PACIFIC PLANNING & ENGINEERING, INC

Source: Belt Collins & Associates

LANDSCAPING PLAN

Figure 7

D. Maintenance Plans

Upon completion of the project, Bishop Estate will dedicate ownership and management, including the operation and maintenance of the reservoir and all associated facilities, to the Board of Water Supply.

E. Management Plans

No use of animal, plant, or mineral resources will be used for the project, therefore, no management plans are required.

F. Historic or Archaeological Site Plan

The results of an archaeological study for the project has determined that no historic or archaeological sites listed on the State or Federal Register are located on the project site. Therefore, a historic or archaeological site plan is not required. The archaeological study is included in the Environmental Assessment report attached as Exhibit A.

II. Consistency With General (G) Subzone Objective

"The objective of this subzone is to designate open space where specific conservation uses may not be defined, but where urban use would be premature."

The proposed Kamehame 990' Water Reservoir Project is consistent with the General Subzone objective because it is a permitted use. As stated in the Department of Land and Natural Resource's Administrative Rules, Title 13, Chapter 2, Section 14:

(c) The following uses are permitted in the (G) subzone:

(2) Development of water collection, pumping, storage, control, and transmission.

Further, the results of studies conducted for an Environmental Assessment (Exhibit A) has determined that the water reservoir project will not result in significant environmental impacts to existing natural and cultural resources on Kamehame Ridge.

DOCUMENT FOR PUBLICATION

IN THE

OEQC BULLETIN

DOCUMENT FOR PUBLICATION IN THE OEQC BULLETIN

TITLE OF PROJECT: Kamehame 990' Water Reservoir

LOCATION: *ISLAND* Oahu *DISTRICT* Hawaii Kai

TAX MAP KEY NUMBERS: 3-9-10: Por. 1

TO BE FILLED OUT BY THE AGENCY ONLY:

TYPE OF ACTION: *AGENCY*_____ *APPLICANT*_____

PLEASE CHECK ALL THAT APPLY IN BOTH CATEGORIES:

CATEGORY 1: Applicable State or Federal Statute

_____ *Chapter 343, HRS* _____ *Chapter 205A, HRS* _____ *NEPA (Federal Actions Only)*

CATEGORY 2: Type of Document

___	*Negative Declaration or FONSI*	___	*Revised Draft EIS*
___	*EIS Preparation Notice or NOP*	___	*Revised Final EIS*
___	*Draft EIS*	___	*Supplemental Draft EIS*
___	*Final EIS*	___	*Supplemental Final EIS*

Please submit to OEQC: *4 copies of the Negative Declarations or EIS Preparation Notices,*
60 copies of the Draft EIS's, and
25 copies of the Final EIS.

PROPOSING AGENCY OR APPLICANT SHOULD SUBMIT COPIES OF THE DOCUMENTS TO THE ACCEPTING AUTHORITY PRIOR TO SUBMITTING COPIES TO OEQC.

ACCEPTING AUTHORITY'S ADDRESS:

CONTACT: *PHONE:*

PROPOSING AGENCY OR APPLICANT'S ADDRESS: Hawaii Kai Development Company
P.O. Box 25007
Honolulu, Hawaii 96825

CONTACT: *PHONE:* 395-2331

CONSULTANT'S ADDRESS: Pacific Planning & Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

CONTACT: Mr. Alvin K. U. Chong *PHONE:* 521-9195

COMMENT LETTERS ADDRESSED TO: *AGENCY OR APPLICANT* X *CONSULTANT* X (copy)

CONDITIONS WHICH TRIGGERED THE EIS LAW, PLEASE CHECK ALL THAT APPLY TO THE PROPOSED ACTION.

____	*Use of State or County lands or funds*	____	*Amendment to a County General Plan*
X	*Use of Conservation District Lands*	____	*Reclassification of Conservation Lands*
____	*Use of Shoreline Setback Area*	____	*Construction or modification of helicopter facilities*
____	*Use of Historic Site or District*	____	*Other*_____
____	*Use of lands in the Waikiki Special District*		

SUMMARY of the proposed action or project to be published in the OEQC Bulletin. Please submit it as a summary ready for publication. The description should be brief (300 words or less), yet provide sufficient detail to convey the full impact of the proposed action.

The Hawaii Kai Development Company is proposing to construct a 0.1 million gallon water reservoir on Kamehame Ridge to provide a reliable supply of water for a planned Kamehame Ridge Unit III subdivision.

The reservoir facility will be constructed on an one-half acre project site. The water reservoir tank will have a spillway elevation of 990 feet and finished floor elevation of 975 feet. Two new transmission mains will be added to the existing water system as part of this project. One transmission main will be used to provide water service to the Unit III subdivision while the second transmission main will supply water to the proposed reservoir from the existing Na Pali Haweo 820' reservoir.

A reservoir access road will be constructed to provide vehicular access to the reservoir facility from a private road leading to the top of the ridge from the Unit III subdivision. Other accessory facilities include an instrument house, fencing, and drainage system for water runoff and erosion control on the reservoir site. A landscaping plan has also been developed to minimize the visual impact of the reservoir facility and prevent soil erosion.

Construction of the reservoir project is planned to commence in December 1992, and will take approximately five to seven months to complete. The construction cost of the project is estimated to be $608,000. Upon completion of the water reservoir project, the reservoir and all associated facilities will be dedicated to the Board of Water Supply by Bishop Estate for their operation and maintenance.

Environmental Assess.

EXHIBIT A

ENVIRONMENTAL ASSESSMENT

FOR

KAMEHAME 990' WATER RESERVOIR

EXHIBIT A

ENVIRONMENTAL ASSESSMENT

FOR

KAMEHAME 990' WATER RESERVOIR

KAMEHAME 990' WATER RESERVOIR

ENVIRONMENTAL ASSESSMENT

Hawaii Kai, Oahu, Hawaii

November 1991

PACIFIC PLANNING
& ENGINEERING, INC

KAMEHAME 990' WATER RESERVOIR

ENVIRONMENTAL ASSESSMENT

Hawaii Kai, Oahu, Hawaii

November 1991

Prepared For:
Hawaii Kai Development Company, Inc.
Hawaii Kai Corporate Plaza, Suite #300
6600 Kalanianaole Highway
Honolulu, Hawaii 96825

Prepared By:
Pacific Planning & Engineering, Inc.
1221 Kapiolani Boulevard, Suite #740
Honolulu, Hawaii 96814

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SECTION 1.0
SUMMARY

Applicant: Hawaii Kai Development Company, Inc. (an affiliate of Bedford Properties, Inc.), Hawaii Kai Corporate Plaza, Suite #300, 6600 Kalanianaole Highway, Honolulu, Hawaii 96825.

Approving Agency: The State Department of Land and Natural Resources (DLNR) is the approving agency because the proposed Kamehame 990' Water Reservoir Project will be located on lands designated for Conservation use.

Project Location: The project location is in the Hawaii Kai District on the island of Oahu. The proposed Kamehame 990' Water Reservoir Project will be located at an elevation of 975 feet on the western slope of Kamehame Ridge.

Tax Map Key The project site is located on a portion of Tax Map Key 3-9-10:1.

Owner: Bishop Estate currently owns the lands located within the project site. The ownership and management of the water reservoir will be dedicated to the City and County of Honolulu Board of Water Supply (BWS) upon completion.

Project Description: A concrete water reservoir of 0.1 million gallons (mg) capacity with a 990-foot (990') spillway elevation will be constructed on Kamehame Ridge at approximately 975 feet above sea level. In addition to the reservoir tank, other associated improvements will include a 14-foot wide access road, two 12-inch diameter water transmission mains, instrument house, retaining wall, landscaping, irrigation and fencing. Water from the existing Na Pali Haweo 820' reservoir will be pumped to the proposed reservoir project. This water will then be gravity fed to service homes in the planned Kamehame Ridge Unit III subdivision. Approximately 3,000 cubic yards of material will be excavated for the reservoir and access road.

Existing Land Uses: The proposed project site for the Kamehame 990' Water Reservoir and related facilities is undeveloped land. The site is characterized by moderately sloping rocky terrain and thin clay soils, with a moderate cover of koa-haole shrubs, kiawe trees, grasses and other plants. Rocky outcroppings are a common feature of the ridge, with plant cover estimated to be about 30 to 40 percent.

Government Approvals/Permits

State Land Use District: According to the State of Hawaii Land Use Commission's Land Use District Boundaries Map, the project site for the Kamehame 990' Water Reservoir is designated Conservation. Therefore, a Conservation District Use Permit (Type B) from DLNR will be required.

County Zoning:

According to the City and County of Honolulu, Department of Land Utilization's Zoning Map Number 1 (Hawaii Kai), the reservoir project site is currently zoned P-1 Restricted Preservation District. All proposed land uses for areas zoned P-1 fall under the jurisdiction of DLNR.

Development Plan:
Public Facilities Map:

A Development Plan Public Facilities Map Amendment is required for the Kamehame 990' Water Reservoir Project according to Attachment A, Criteria for Development Plan Public Facilities Map (Rev. 9/85), of the City and County of Honolulu, Department of General Planning (DGP) Form 101. Based upon Attachment A, water reservoirs are classified as "major" projects, and must be shown on the Development Plan Public Facilities map. City Council approval is required for an amendment to the Development Plan Public Facilities Map.

Board of Water Supply:

The Board of Water Supply (BWS) requested a water system master plan for the Kamehame Ridge to ensure that the proposed system will adequately provide for existing and planned subdivisions on the ridge. The water system master plan for Kamehame Ridge has been prepared and approved by the BWS.

SECTION 2.0
BACKGROUND

2.1 HAWAII KAI DEVELOPMENT COMPANY, INC.

The Hawaii Kai Development Company Inc. is the applicant for the proposed Kamehame 990' Water Reservoir Project. The company is an affiliate of Bedford Properties, Inc. (Bedford) which is a real estate management and development company that was founded nearly three decades ago, and currently has local operations in Hawaii Kai.

2.2 KAMEHAME RIDGE UNIT III SUBDIVISION

The proposed water reservoir project is intended to serve the planned Kamehame Ridge Unit III (Unit III) subdivision development. This subdivision is a single-family residential development currently being planned by the Hawaii Kai Development Company, Inc. It will be developed on a 13.8 acre site located above (mauka) the recently completed Na Pali Haweo subdivision development on Kamehame Ridge. The subdivision is expected to include approximately 33 fee simple house lots ranging in size from 10,000 square feet to 55,000 square feet. Located approximately 800 to 900 feet above sea level, the house lots should offer panoramic views of Maunalua Bay, Hawaii Kai, Kalama Valley, and the coastline.

Excavation and grading activities for the Unit III subdivision are scheduled to coincide with construction activities for the Kamehame 990' Water Reservoir Project for approximately four to six months. Construction work on the subdivision is expected to begin immediately following the completion of excavation work for the reservoir. Approximately 240,000 cubic yards of material are planned to be excavated and filled on the subdivision site.

2.3 NA PALI HAWEO SUBDIVISION

An existing water reservoir, known as the Na Pali Haweo 820' reservoir, will be used to supply water to the proposed Kamehame 990' Water Reservoir project. This reservoir was constructed to provide water service to the Na Pali Haweo Subdivision.

The Kamehame Ridge Unit II subdivision development, known as Na Pali Haweo, is a single-family residential project that was recently developed by the Hawaii Kai Development Company, Inc. This subdivision is located *directly below (makai) the planned Kamehame Ridge Unit III subdivision.* The 72.5 acre development has a total of 193 house lots with infrastructure installed. Pacific Homes, the residential development company affiliate of Bedford, is currently selling house lots in the first two increments of the Na Pali Haweo development.

Associated with the Na Pali Haweo subdivision development is a relocation of an existing 46 kV sub-transmission line from the eastern slope of Kamehame Ridge to the western slope. This relocated sub-transmission line will connect to another existing sub-transmission line which currently runs the length of Kamehame Ridge near the ridgeline. The relocation is scheduled to commence in early 1992, and will take approximately 55 days to complete. As a result, construction activities associated with the line's relocation will not coincide with construction activities for the Kamehame 990' Water Reservoir Project.

SECTION 3.0
PROJECT NEED AND OBJECTIVES

3.1 NEED FOR PROJECT

The Kamehame Ridge Unit III subdivision development will require the proposed water reservoir project to adequately accommodate the water needs of future Unit III residents. Based upon the Board of Water Supply's (BWS) Water System Standards,[1] the following criteria is used by the BWS to determine the water capacity required for a water reservoir:

1. Demand factors:
   - Maximum Daily Demand = 1.5 X Average Daily Demand.
   - Peak Hour Demand = 3.0 X Average Daily Demand.
2. Fire flow factors:
   - Fire Flow - 1,000 gallons per minute for one hour.
   - Reservoir capacity must provide a required flow rate of Maximum Daytime Flow + Fire Flow rate for a one-hour duration.
   - Reservoir must be 75 percent full at start of fire.

Using the given criteria described above, the projected water requirements for the Unit III subdivision were calculated. The results of the calculations are shown below in Table 3.1 and indicate that a total of 82,080 gallons (gal) of water is required to service the subdivision.

---

1 Department of Water, County of Kauai; Board of Water Supply, City and County of Honolulu; Department of Water Supply, County of Maui; and Department of Water Supply, County of Hawaii, Water System Standards, State of Hawaii, 1985

Table 3.1

WATER REQUIREMENTS FOR KAMEHAME RIDGE UNIT III SUBDIVISION

DOMESTIC DEMAND REQUIREMENTS				
1. Average Daily Demand				
Domestic Consumption Guideline (Residential)	500	gal/unit		
Kamehame Ridge Unit III Subdivision	x 33	units		
Projected Average Daily Demand	16,500	gpd[1]		
2. Conversion to Maximum Daily Demand				
Average Daily Demand	16,500	gpd		
Multiplier Factor	x 1.5			
Maximum Daily Demand	24,750	gpd		
3. Conversion to Maximum Daily Flow Rate				
Maximum Daily Demand	24,750	gpd		
Minutes Use Per Day (16 hours/day)	+ 960	minutes		
Maximum Daily Flow Rate			**26**	**gpm[2]**
FIRE FLOW REQUIREMENT				
Fire Flow (gpm) for One Hour Duration				
Land Use - Single-Family			**1,000**	**gpm**
RESERVOIR CAPACITY REQUIREMENT				
1. Determine Combined Flow Rate				
Domestic Maximum Daily Flow Rate	26	gpm		
Fire Flow Rate	+ 1,000	gpm		
Combined Domestic And Fire Flow Rates	1,026	gpm		
2. Conversion to Gallons				
Combined Domestic And Fire Flow Rates	1,026	gpm		
Minutes Conversion Factor	x 60	minutes		
Total Water Demand	61,560	gal		
3. Reservoir Capacity Required				
Total Water Demand	61,560	gal		
Reservoir Requirement 3/4 Full	+ .75			
Total Capacity Required			**82,080**	**gal**
MINIMUM RESERVOIR SIZE			**0.1**	**mg**

1 Gallons Per Day
2 Gallons Per Minute

There are three water reservoirs currently located on Kamehame Ridge providing water service to residents of the Kamehame Ridge Unit I and Na Pali Haweo subdivisions. These reservoirs are the Na Pali Haweo 820' (0.2 mg), Kamehame 500' (1.5 mg), and Kamiloiki 170' (0.2 mg) water reservoirs. To provide water service to the planned Kamehame Ridge Unit III subdivision using these existing reservoirs, the Na Pali Haweo 820' reservoir would need to pump water uphill to the new house lots.

The existing Na Pali Haweo 820' reservoir would have enough water capacity to meet the domestic demand projected for the planned Kamehame Ridge Unit III subdivision. However, this reservoir would not have sufficient water capacity to meet the BWS's fire flow protection criteria. In addition, discussions with staff from the BWS have indicated that a gravity flow reservoir system located at least 100 vertical feet above the Unit III subdivision is strongly recommended to ensure water system reliability and meet current fire flow requirements.

Since the Na Pali Haweo 820' reservoir is located below the Unit III subdivision, the reservoir cannot use gravity feed to service the new subdivision. Further, in the event of a power failure, the Na Pali Haweo 820' reservoir would not be able to pump water up to the Unit III subdivision for fire protection. Accordingly, Bedford Properties is proposing to construct the proposed water reservoir project to adequately meet the water requirements for the Unit III subdivision.

3.2 OBJECTIVES OF PROPOSED PROJECT

The objective of the proposed Kamehame 990' Water Reservoir project is to provide an adequate and reliable supply of water to the Kamehame Ridge Unit III subdivision. This water reservoir project would adequately meet all of the BWS's criteria and previously discussed requirements .

Based upon the projected water requirements for the Kamehame Ridge Unit III subdivision shown in Table 3.1 (assumes 33 house lots), a reservoir having a capacity of at least 82,080 gallons of water would be required. The proposed water reservoir project will have a capacity of 100,000 gallons which exceeds the reservoir's water requirements for the Unit III subdivision.

The reservoir project would also be sited at the 975 foot elevation on Kamehame Ridge which would meet BWS's criteria for providing an adequate gravity flow water system. As a result, the water reservoir would be able to provide sufficient water volumes to meet fire protection requirements in the event of a power outage.

In addition, a Water Master Plan showing the proposed water system serving the Kamehame Ridge Unit I, Na Pali Haweo, and planned Kamehame Ridge Unit III subdivisions was submitted to the BWS for their review and approval. The Water Master Plan was required by the BWS to ensure that the existing and proposed subdivision would be satisfactorily serviced by the proposed water system which includes the addition of the proposed water reservoir project. The Water Master Plan has been approved by the BWS, and a copy of their letter of approval is included in Appendix D.

SECTION 4.0
PROPOSED PROJECT

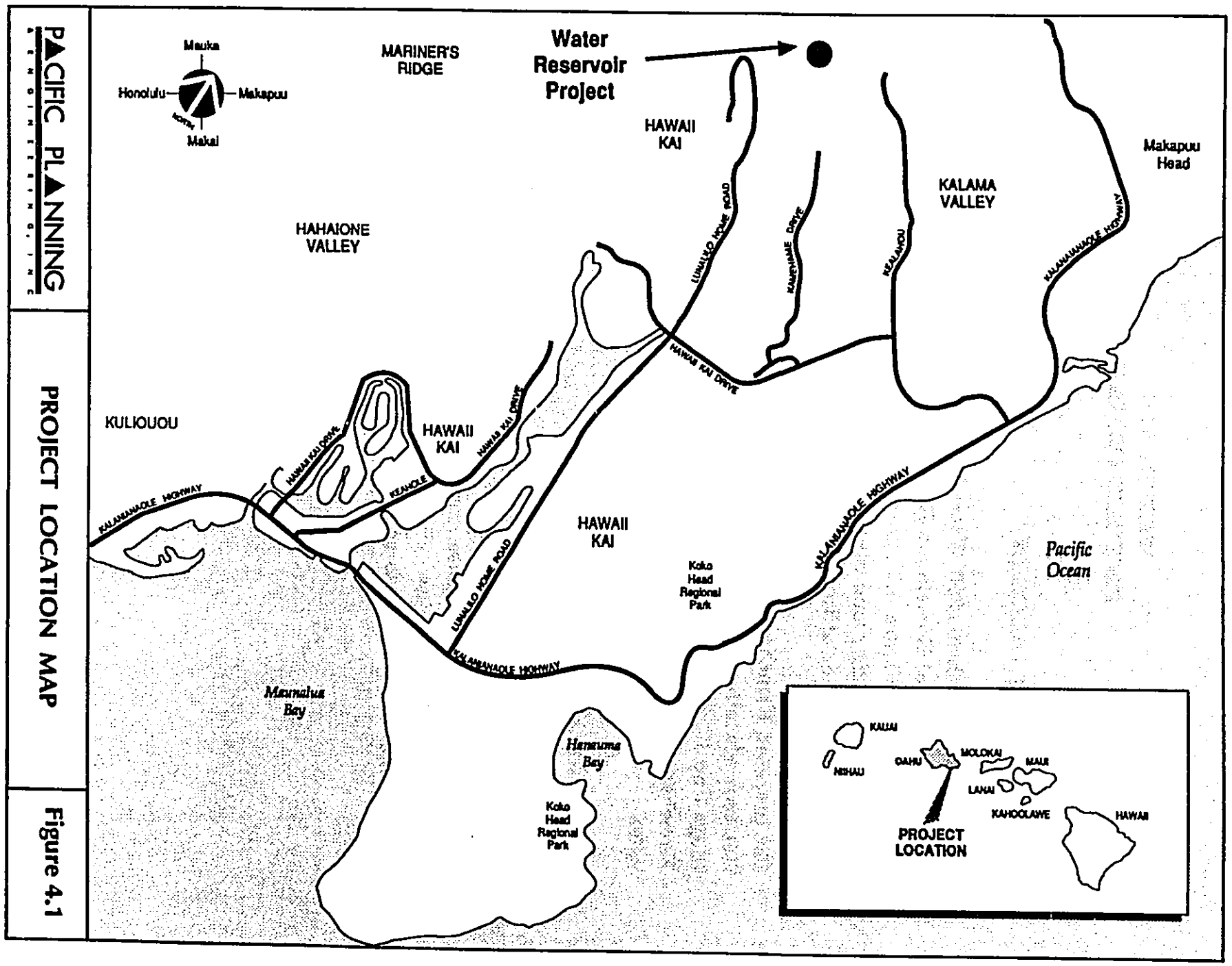
4.1 PROJECT LOCATION

The proposed Kamehame 990' Water Reservoir Project will be located on the upper west slope of Kamehame Ridge in the Hawaii Kai District on the island of Oahu. Figure 4.1 shows the project location while Figure 4.2 shows the surrounding land uses in the vicinity of the site. The project site is located on a portion of Tax Map Key 3-9-10:1.

The proposed Kamehame 990' Water Reservoir is to be constructed at 975 feet base elevation on Kamehame Ridge, above the planned Kamehame Ridge Unit III subdivision. The site will be located on the west (ewa) side of Kamehame Ridge along the existing private road leading to the top of the ridge.

4.2 PROJECT DESCRIPTION

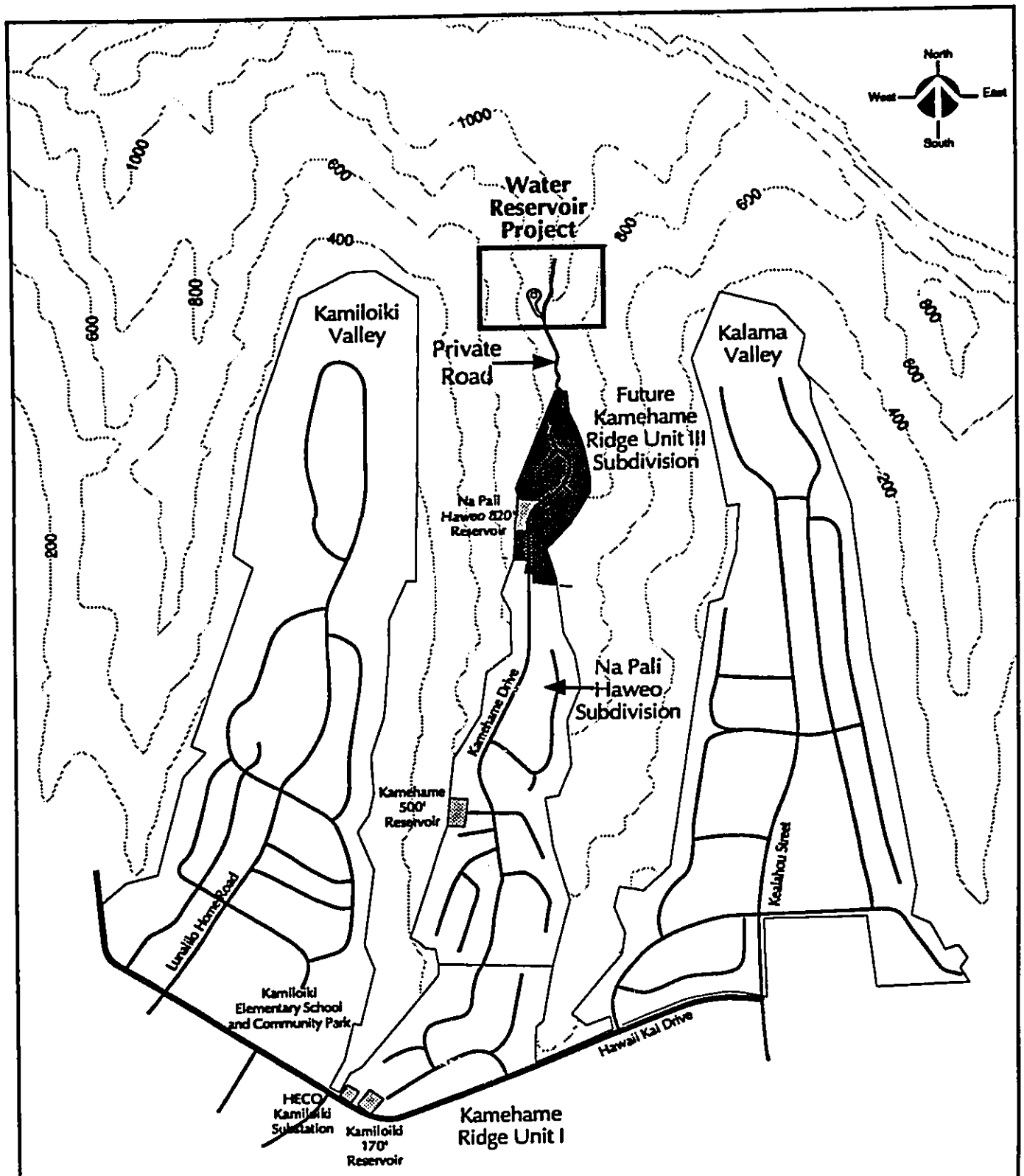
The total reservoir project site measures approximately one-half acre. The proposed project includes a reservoir tank, transmission mains, reservoir access road, instrument house, retaining wall, landscaping and chain link fencing around the facility. Figure 4.3 shows a site plan of the proposed Kamehame 990' Water Reservoir.



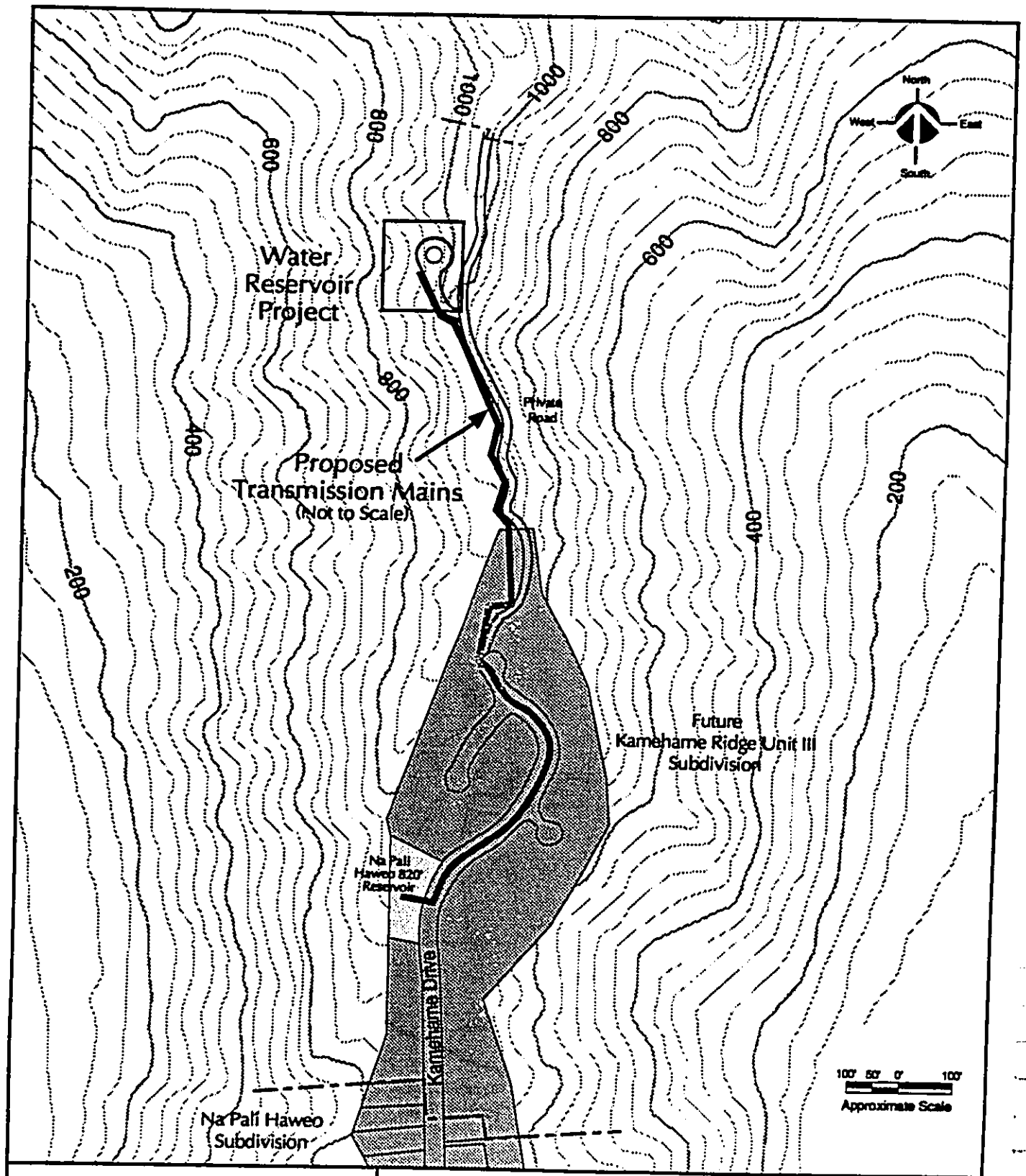
PACIFIC PLANNING & ENGINEERING, INC.

PROJECT LOCATION MAP

Figure 4.1



PACIFIC PLANNING & ENGINEERING, INC	PROJECT VICINITY MAP	Figure 4.2



PACIFIC PLANNING & ENGINEERING, INC	PROJECT SITE PLAN	Figure 4.3

4.2.1 Description of Reservoir Facilities

Reservoir Tank

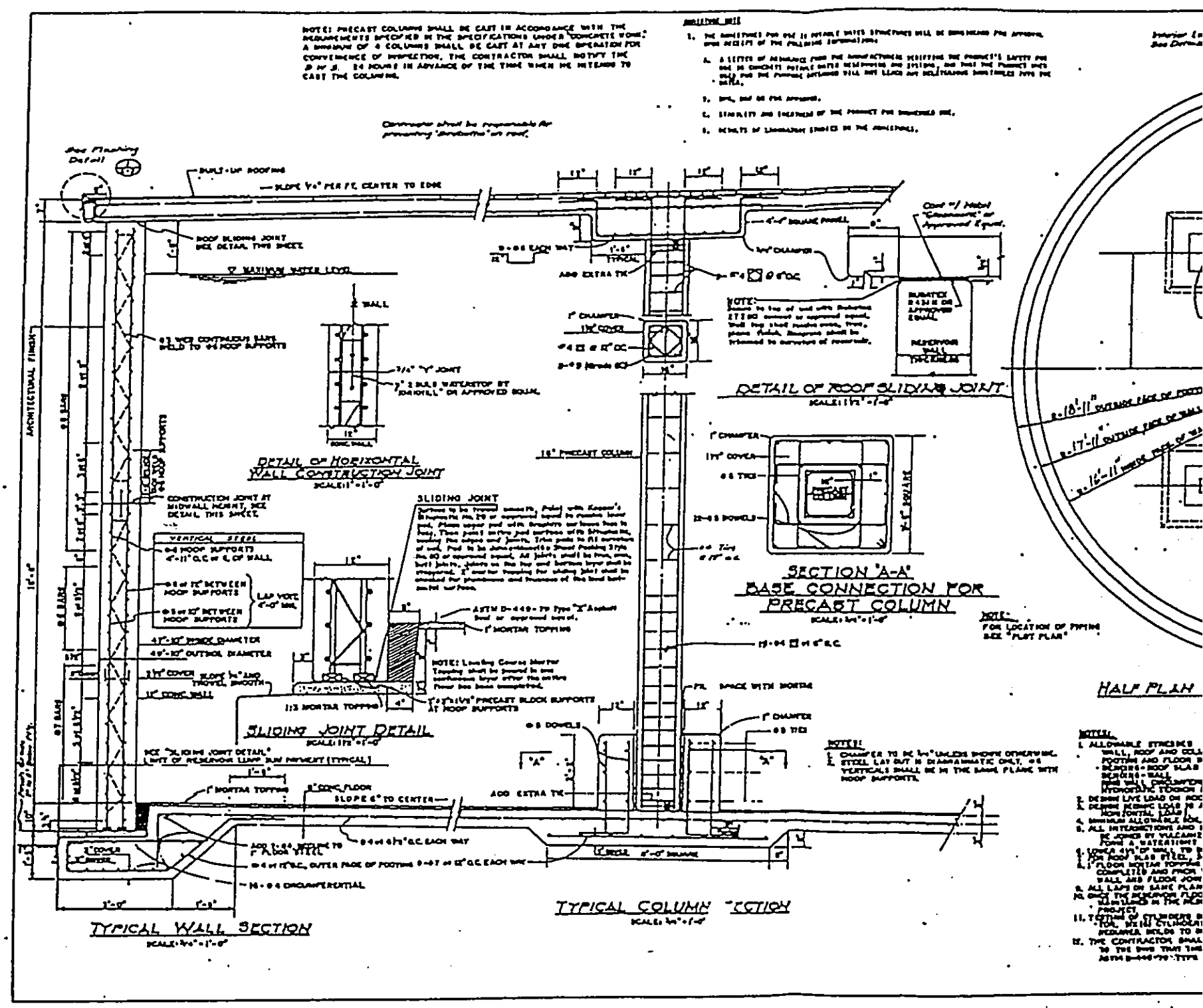
The proposed Kamehame 990' Water Reservoir will have a capacity of 0.1 million gallons (mg), and a spillway elevation of 990 feet. Its planned finished floor elevation will be 975 feet. The reinforced concrete tank will measure approximately 17 feet in height with a diameter of approximately 38 feet when completed. It will be painted a neutral earth-tone color to blend in with the surrounding landscape. Figure 4.4 shows a preliminary construction plan for the reservoir tank.

Transmission Mains

Two new transmission mains will be added to the existing water system as part of this project to provide water service to the Unit III subdivision. The site plan previously shown on Figure 4.3 shows the general routing alignment of these new transmission mains.

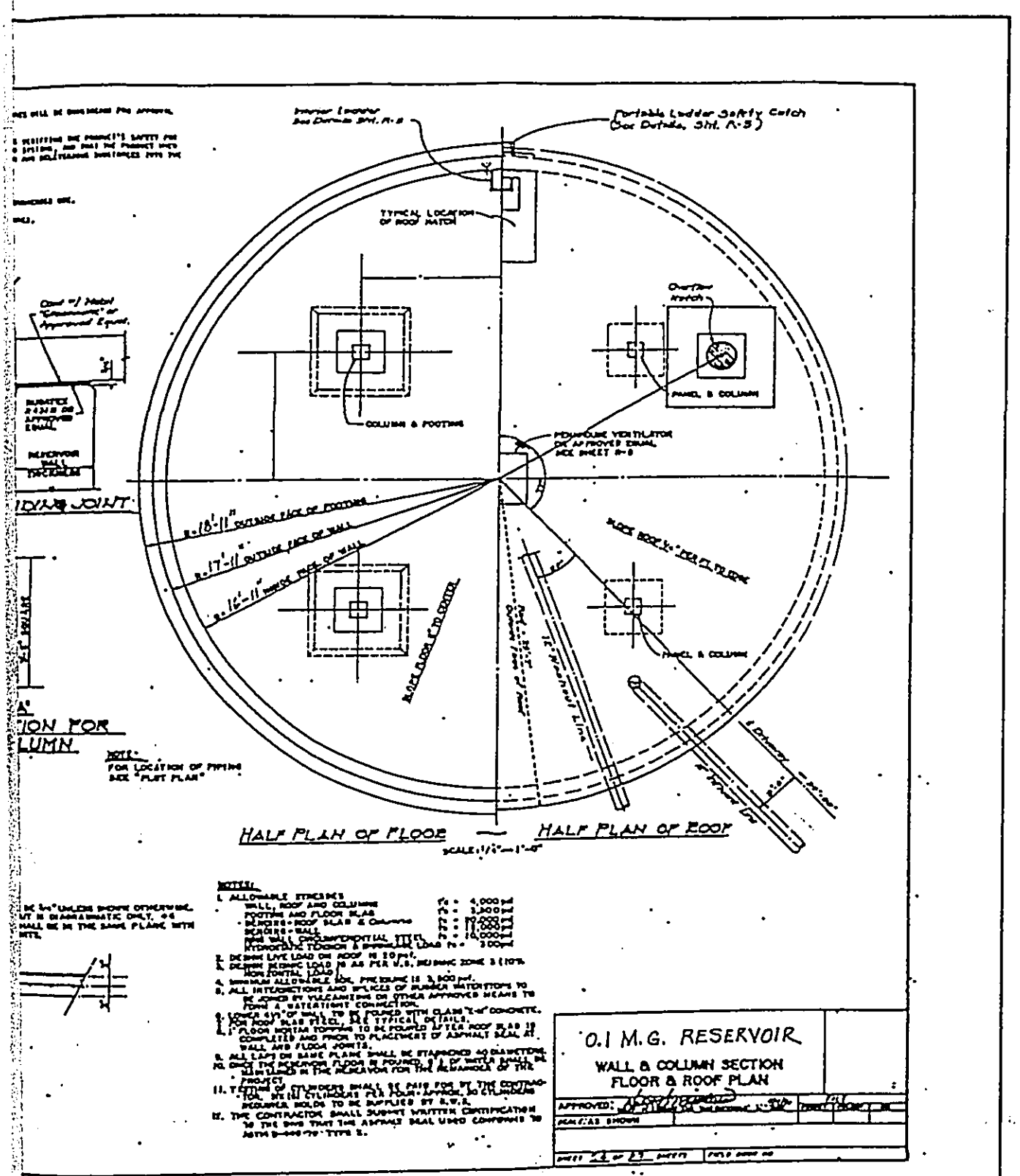
A 12-inch transmission main will be generally routed along the existing private road from the proposed reservoir site to the Unit III subdivision site. This transmission main will be used to provide water service to the future homes of the Unit III subdivision.

A second transmission main will be constructed to connect the Na Pali Haweo 820' reservoir with the proposed Kamehame 990' reservoir. This transmission main will be used to supply water for the 990' reservoir tank via a booster added to the Na Pali Haweo 820' reservoir. It will also be routed along Kamehame Drive and the private road leading to the project site.



PACIFIC PLANNING
ENGINEERING, INC
Source: Richard Sato and Associates

PRELIMINARY CONSTRUCTION



Y CONSTRUCTION PLAN

Figure 4.4

Access Road

A paved reservoir access road, 80 feet in length, will be constructed to provide vehicular access from the private road to the reservoir facility. This new access road will connect with the existing private road at a point approximately 1,000 feet from the Kamehame Ridge Unit III subdivision site. The road will be 14 feet wide, and vehicular access will be controlled by a locked chain-link security gate.

Other Improvements

A 15-foot high reinforced concrete retaining wall will be constructed east of the reservoir tank. The wall will be semi-circular in shape and approximately 90 feet in length.

A drainage system will be provided for water runoff and erosion control on the reservoir site. A study will be undertaken during the engineering design phase of the project to determine the most appropriate type of drainage system required to minimize the impact of storm water runoff and reservoir overflow. The drainage system will be constructed in conformance with BWS and County Department of Public Works standards.

Approximately 3,000 linear feet of fencing will enclose the reservoir site and access road. The fence will be 6-feet high, and constructed in accordance with BWS standards.

An instrument house will also be constructed near the reservoir to accommodate sensing instruments and other equipment for regulating reservoir water levels. The 8-foot high instrument house will have a floor area of approximately 48 square feet, and will be constructed primarily of concrete block.

A landscaping plan has been developed by Belt Collins and Associates for the reservoir project to minimize the visual impact of the reservoir facility and prevent soil erosion. This landscaping plan is shown on Figure 7.1 in Section 7.6 Visual Resources. Graded areas will be roughened before top soil is added. Seeds of kiawe and ryegrass will then be scattered on the soil, and an erosion-control fabric applied. Lastly, the slopes will be hydro-mulched to promote vegetative growth. The landscaping and irrigation work should take approximately two weeks to install, and will conform to BWS standards.

4.2.2 Maintenance of Reservoir Facilities

Bishop Estate is the current owner of the lands within and surrounding the project site. Upon completion of the water reservoir project, the reservoir and all associated facilities will be dedicated to the BWS by Bishop Estate for their operation and maintenance.

4.3 CONSTRUCTION METHOD

The proposed Kamehame 990' Water Reservoir Project will require about six full-time construction workers along with approximately 10 dump-trucks. A loader, bulldozer and backhoe will also be required. A staging site for the storage of construction materials and equipment is expected to be located near the reservoir tank site.

Approximately 3,000 cubic yards of material will be excavated from the project site, and are planned to be used as fill for the Unit III subdivision site and road construction. A backhoe will be used for excavation and to install the transmission mains. The backhoe is expected to safely excavate material from the ridge, therefore, barricades will not be required to prevent rockfall.

The construction of the reservoir facility will begin once the excavation work is completed, and transmission mains will be installed underground just prior to the paving of the access road. Throughout all phases of the project, a water truck will be used to minimize dust resulting from construction activities.

4.4 CONSTRUCTION SCHEDULE AND ESTIMATED COST

Construction of the reservoir project is planned to commence in December 1992, and will take approximately five to seven months to complete. Grading and excavation activities are expected to occur for approximately one month while the construction of the reservoir, facilities and transmission mains lasting four to six months. The construction cost of the proposed water reservoir project is estimated to be $608,000.

SECTION 5.0
ALTERNATIVES CONSIDERED

5.1 ALTERNATIVE A - NO ACTION

Under this alternative, a new water reservoir would not be constructed to serve future residents of the Kamehame Ridge Unit III subdivision. As a result, these homeowners would need to provide their own water systems (e.g. wells or catchment systems).

The development of private water systems is permitted in the Hawaii Kai area, however, State water use and well construction permits would be required for each homeowner. Individual water catchment systems are also allowed, however, the historically low level of rainfall on Kamehame Ridge would make catchment systems unfeasible as a primary source of water.

According to the Water Resources of Southeastern Oahu,[2] all wells drilled in the Hawaii Kai area have yielded non-potable (brackish) water and have been abandoned. Further, homeowners would be responsible for water quality monitoring and treatment of these individual water systems.

Since it would not be feasible for homeowners to develop their own water systems because of the uncertainty of finding potable water, and the inconveniences and costs involved, this alternative was not studied further.

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2 Takasaki, K.J., and Mink, J.F., Water Resources of Southeastern Oahu, U.S. Geological Survey Water Resource Investigations 82-628, 1982.

SECTION 6.0
EXISTING CONDITIONS

6.1 SETTING

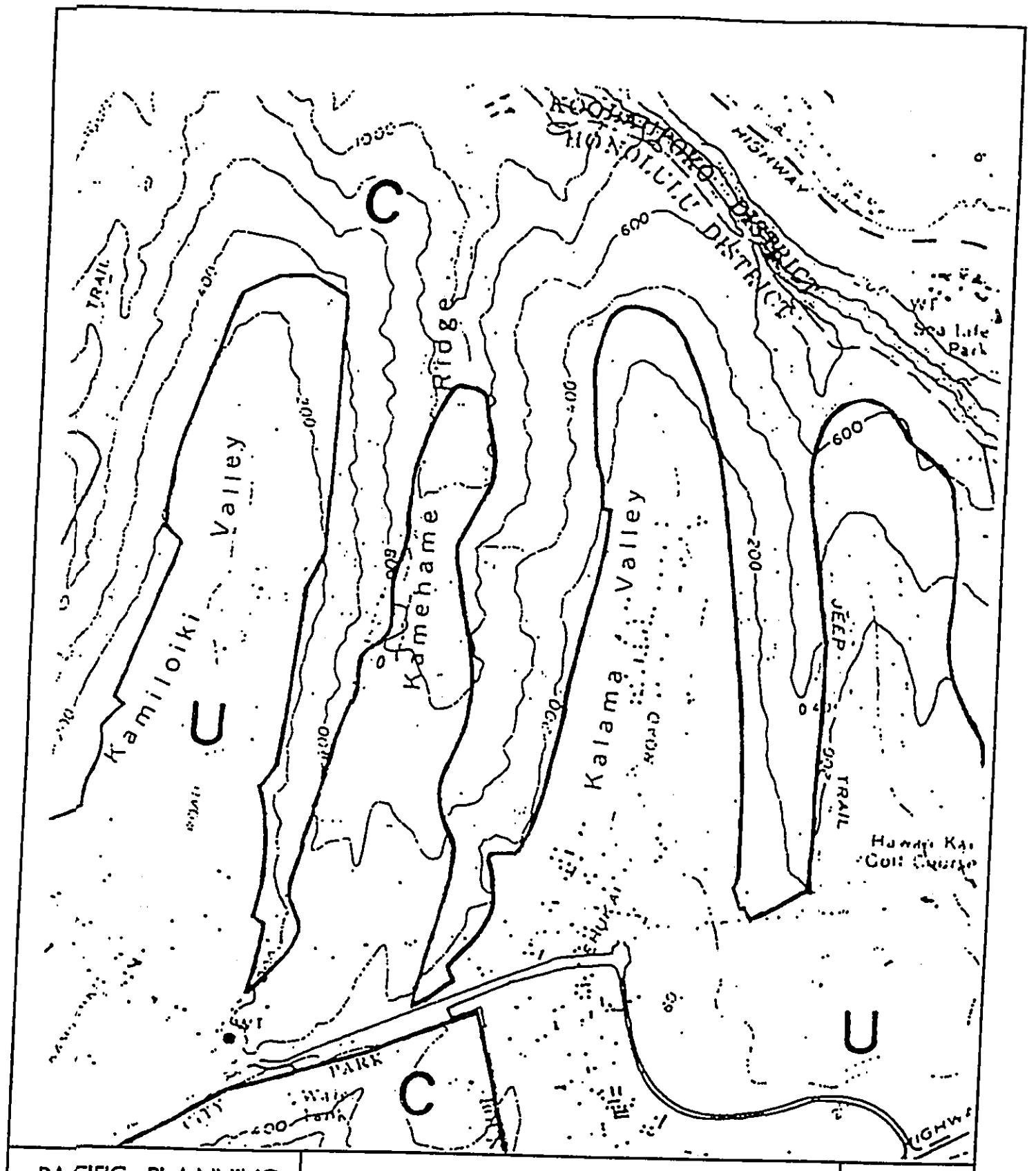
The water reservoir project is located on the island of Oahu which is the third largest island in the State with a total land area of 608 square miles. It is the center of government and industry in the State of Hawaii, and is the home for 80 percent of the State's population. The Hawaii Kai region, located on the eastern portion of the Honolulu District, is predominantly made up of residential communities and small commercial centers.

Kamehame Ridge is part of the southern flank of the Koolau Mountain Range, and located north (mauka) of Koko Head Crater between Makapuu Head and Kaluanui (Mariner's) Ridge. Kamehame Ridge rises to an elevation of more than 1,000 feet above sea level at its peak which overlooks Waimanalo Bay. Kamehame Ridge divides the residential subdivisions of Kamiloiki Valley on the west and Kalama Valley on the east.

6.2 LAND USE DESIGNATIONS

6.2.1 State Land Use Designation

The Hawaii State Land Use Commission classifies all lands in the State into four land use districts: Urban, Rural, Agricultural, and Conservation. The proposed water reservoir project and access road will be located entirely within the State's Conservation District. Figure 6.1 shows the State Land Use boundaries in the vicinity of the project site. Proposed land uses located within Conservation Districts are regulated by DLNR, resulting in the need for a Conservation District Use Permit (Type B) for the proposed water reservoir project.



PACIFIC PLANNING	State Land Use Designations	Figure 6.1
Source: State Land Use Map O-15		

6.2.2 City and County of Honolulu Land Use Designations

Development Plan Land Use Maps

According to the City and County of Honolulu Development Plan Land Use Map for East Honolulu, the water reservoir project will be located in area designated Preservation and falling within the jurisdiction of the DLNR.

A Development Plan Public Facilities Map Amendment for privately funded projects will be required for the proposed water reservoir project based upon Attachment A of the Department of General Planning's (DGP) Form 101. Under Attachment A (Criteria for Development Plan Public Facilities Map), water reservoirs are classified as "major" projects, and must be shown on the Development Plan Public Facilities map. Approval by the City Council is required for an amendment to the Development Plan Public Facilities Map.

Zoning Maps

According to the City and County of Honolulu Department of Land Utilization (DLU) Zoning Map No. 1, the water reservoir and associated facilities will be located in an area currently zoned Restricted Preservation (P-1). Based upon the DLU's Land Use Ordinance, all land uses in areas zoned P-1 fall within the jurisdiction of the DLNR.

6.3 EXISTING AND SURROUNDING LAND USES

6.3.1 Existing Land Uses

The water reservoir project site is proposed to be located on undeveloped land. This project site is mountainous, has a rocky terrain, and is vegetated with shrubby koa-haole, kiawe trees, grasses and other plants.

6.3.2 Surrounding Land Uses

The proposed water reservoir and Unit III subdivision site are situated above several residential areas. Residential subdivisions are located in Kamiloiki Valley to the west (ewa) and Kalama Valley to the east (Makapuu) of Kamehame Ridge. These subdivisions consist primarily of single-family residences, along with several parks (Kamiloiki Neighborhood Park, Kamiloiki Community Park and Kamiloiki Community Center) and Kamiloiki Elementary School. In Kamiloiki Valley, a new subdivision is currently being developed at the foot of Kamehame Ridge below the proposed water reservoir site. South of the Unit III subdivision are the Na Pali Haweo and Kamehame Ridge Unit I subdivisions consisting of single-family residential units, and a small neighborhood park located in the Na Pali Haweo subdivision.

SECTION 7.0
PHYSICAL AND NATURAL ENVIRONMENT

This section provides a description of the physical and natural environments that may be impacted by the proposed project. A description of existing environmental conditions is presented with an assessment of probable impacts resulting from the proposed project. The environmental assessments included in this report are based upon studies performed by staff planners and by subconsultants.

7.1 PHYSICAL ENVIRONMENT

7.1.1 Existing Conditions

Geology and Topography

The island of Oahu is volcanic in origin, and consists of the Waianae Range on the west and the Koolau Range on the east connected by the Schofield Plateau. These mountain ranges are the remnants of the heavily eroded Waianae and Koolau shield volcanoes. The Koolau Range was formed during the Tertiary Period by pahoehoe and aa basalt volcanic lava flows. Later, deep valleys like Kalama and Kamiloiki were eroded, leaving ridges of more resistant rock such as Kamehame Ridge.

Kamehame Ridge is composed of seaward dipping (about 10 degrees) pahoehoe basalt flows with a few (less than 10 percent of total volume) aa basalt flows.[3] Pahoehoe is a smooth, hummocky, vesicular rock containing occasional lava tubes and cavities. Aa basalt consists of dense, blocky, core rock surrounded by clinker.

---

3 Geolabs-Hawaii, Updated Geotechnical Engineering Evaluation for Proposed Kamehame Ridge Subdivision Units II & III , November 1988.

SECTION 7.0
PHYSICAL AND NATURAL ENVIRONMENT

This section provides a description of the physical and natural environments that may be impacted by the proposed project. A description of existing environmental conditions is presented with an assessment of probable impacts resulting from the proposed project. The environmental assessments included in this report are based upon studies performed by staff planners and by subconsultants.

7.1 PHYSICAL ENVIRONMENT

7.1.1 Existing Conditions

Geology and Topography

The island of Oahu is volcanic in origin, and consists of the Waianae Range on the west and the Koolau Range on the east connected by the Schofield Plateau. These mountain ranges are the remnants of the heavily eroded Waianae and Koolau shield volcanoes. The Koolau Range was formed during the Tertiary Period by pahoehoe and aa basalt volcanic lava flows. Later, deep valleys like Kalama and Kamiloiki were eroded, leaving ridges of more resistant rock such as Kamehame Ridge.

Kamehame Ridge is composed of seaward dipping (about 10 degrees) pahoehoe basalt flows with a few (less than 10 percent of total volume) aa basalt flows.[3] Pahoehoe is a smooth, hummocky, vesicular rock containing occasional lava tubes and cavities. Aa basalt consists of dense, blocky, core rock surrounded by clinker.

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3 Geolabs-Hawaii, Updated Geotechnical Engineering Evaluation for Proposed Kamehame Ridge Subdivision Units II & III , November 1988.

The topography of Kamehame Ridge is irregular with isolated knolls and small erosion gullies extending throughout the area. Height elevations on Kamehame Ridge where the reservoir and related facilities are to be sited range from approximately 800 to 1,000 feet above sea level. The project site is undeveloped mountainous land with generally steep slopes (greater than 30 percent).

Climate

The climate in the vicinity of Kamehame Ridge is typical of Oahu's climate with mild and steady temperatures throughout the year, moderate humidity, and relatively constant northeasterly tradewinds. The average temperature has historically been about 75° F, with maximum temperatures in the high 80°s and minimum temperatures in the low 60°s. Prevailing tradewinds blow steadily from the northeast with greater persistence during the summer months than during the winter. Kamehame Ridge has historically received an average annual rainfall of 20 to 30 inches.

Soils

A 1972 Soil Survey by the United States Department of Agriculture Soil Conservation Service (SCS) classifies the project site as Rock Land (rRK).[4] This Rock Land classification designates areas where exposed rock covers 25 to 90 percent of the surface. Rock outcrops composed primarily of basalt and andesite along with very shallow soils are the predominant characteristics.

Soils associated with Rock Land are predominantly comprised of clay and are well-drained, but are not suited to machine cultivation due to an abundance of rock. A study conducted by Geolabs-Hawaii confirmed the soil character in the vicinity of the site as shallow, dark clay underlain by weathered vesicular basalt parent material.[5]

4 US Department of Agriculture Soil Conservation Service, Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii , USDASCS, August 1972.

5 Geolabs-Hawaii, Updated Geotechnical Engineering Evaluation for Proposed Kamehame Ridge Subdivision Units II & III , November 1988.

A Land Study Bureau report entitled "Detailed Land Classification - Island Of Oahu"[6] determined that the project site's suitability for agricultural use is low having an Overall Productivity Rating of 'E'.[7] This productivity rating was derived using various factors such as general soil character, slope, and rainfall. Presently, no agricultural uses are sustained on the project site.

7.1.2 Probable Impacts

No significant long-term changes or impacts to the physiography or geologic processes of Kamehame Ridge are expected. This is due to the small size of the reservoir site and plans for landscaping and a drainage system. Construction activities for the water reservoir and associated facilities will be limited to a small area resulting in minimal soil disturbance. The installation of landscaping and a drainage system will ensure that soil erosion is abated. Furthermore, the reservoir will not interfere with the contours of the ridge, therefore, the overall physiography of the ridge will not be affected.

7.2 WATER RESOURCES

This section discusses the water resources in the project's vicinity, anticipated water requirements, and potential project impacts.

7.2.1 Existing Conditions

Groundwater is the major source of potable water on Oahu, providing about 95 percent of the island's total water supply. The aquifer systems of Oahu provide a premium source of potable water which have been efficiently tapped for nearly a century. The BWS manages, controls and operates all public water systems within all seven districts on Oahu.

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6 Murabayashi, Edwin T. and Iwao Kuwahara. Oahu Lands Classified by Physical Qualities For Urban Usage. Land Study Bureau, University of Hawaii, June 1969.

7 The Overall Productivity Rating evaluates each Land Type in its overall productive capacity in agricultural use. The productivity rating ranges from A to E with A representing agricultural land having the highest quality and E representing agricultural land having the lowest quality.

The BWS's Honolulu and Windward Districts provide water for the Hawaii Kai area, which includes Kamehame Ridge. Based upon the Water Resources Protection Plan,[8] the Honolulu and Windward Districts have estimated sustainable yields of 50 million gallons per day (mgd) and 100 mgd, respectively. According to the BWS's Annual Report and Statistical Summary, July 1989-June 1990, the Honolulu and Windward Districts have estimated demands of 85 mgd and 19 mgd, respectively. Thus, water from the Windward District is needed to meet the existing demand of the Honolulu District.

The overall water consumption for the southeastern Oahu region, which extends approximately from Kailua to Aina Haina, is about 18 mgd, of which up to 4 mgd is pumped from sources within the area.[9] The remaining 14 mgd is piped into the region through BWS transmission mains originating from both the Honolulu and Windward Districts.

There are three existing water reservoirs located on Kamehame Ridge which supply the water needs of existing Kamehame Ridge residential subdivisions, as well as other residences in the Hawaii Kai area. These are the Na Pali Haweo 820' (0.2 mg) reservoir, Kamehame 500' (1.5 mg) reservoir and the Kamiloiki 170' (2 mg) reservoir.

7.2.2 Probable Impacts

Potential impacts to the Honolulu and Windward District's water resources were assessed on the basis of the BWS's ability to accommodate the increased water requirements associated with the water reservoir project. A Water Master Plan for Kamehame Ridge has been approved by the BWS indicating the system's ability to accommodate the additional water requirements.

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8 Commission on Water Resource Management, Department of Land and Natural Resources, Water Resources Protection Plan , Honolulu, State of Hawaii, 1990.

9 Ibid.

As shown on Table 3.1, the Kamehame Ridge Unit III subdivision's 33 house lots would increase water consumption in the southeastern Oahu region by approximately 16,500 gallons per day. This additional water demand would represent an increase of approximately 0.1 percent of the total demand for the Southeast Oahu region. The slight increase in demand is not expected to have any significant short or long-term impacts on the Honolulu and Windward District systems which have sufficient capacity to accommodate the additional water requirements.

7.3 AIR RESOURCES

The allowable ambient concentrations of air pollutants are regulated by Federal and State ambient air quality standards (AAQS). Of the regulated air pollutants, carbon monoxide, particulate matter, and PM-10 (particulate matter 10 microns or less in diameter) were determined to be the primary pollutants which may be associated with the proposed project.

7.3.1 Existing Conditions

Air sampling data for regulated pollutants are periodically taken from various monitoring sites on Oahu. These data are listed in the State Department of Health's Hawaii Air Quality Data report which is published periodically. Existing levels of pollutants determined to be associated with the project were reviewed, using the Hawaii Air Quality Data report for the period of January 1985 to December 1987.

The Waimanalo air quality monitoring station, located at the Waimanalo Wastewater Reclamation Facility, is the monitoring station closest to the project site. This facility samples levels of particulate matter. Air sampling data obtained from the monitoring station between 1985 and 1987 showed no incidents of Federal and State AAQS being exceeded. A monitoring station located in the Liliha area measures PM-10 for Federal AAQS and showed that the PM-10 standard was not exceeded during this same period.

Carbon monoxide samples (998 samples) taken from a monitoring station located in Waikiki showed that Federal AAQS were not exceeded, although State AAQS were exceeded six times. These incidences occurred in 1985, and were primarily due to relatively high concentrations of traffic volumes occurring in Waikiki and the surrounding area.

7.3.2 Probable Impacts

The project will not result in any significant long-term impacts associated with the operation of the reservoir facility. As a result, potential impacts to air quality in the vicinity of the project is assessed in terms of short-term construction related impacts. Consideration was also given to construction activity associated with the development of the future Kamehame Ridge Unit III subdivision.

Construction activities are expected to have a minor and temporary impact to air quality in the area resulting from increased fugitive dust and vehicular emissions. However, no exceedances of State and Federal AAQS for carbon monoxide, particulate matter and PM-10 are expected to occur.

Emissions of fugitive dust from construction activities is difficult to accurately estimate because it varies greatly depending upon the type of soil, amount and type of soil-disturbing activity, moisture content of exposed soil in work areas, and wind speed. However, based upon the Rock Land (rRK) soil classification for the project site, the potential for significant amounts of fugitive dust emitted during constructions activities should be quite low compared with grading activities occurring on agricultural land. In addition, only about 3,000 cubic yards of material will be excavated from the site, and proper measures such as a construction watering program will be implemented to minimize fugitive dust emissions. Consequently, emissions of fugitive dust from the project should not result in air pollution levels exceeding the State and Federal AAQS for particulate matter and PM-10.

On-site mobile and stationary construction equipment will emit some air pollutants in the form of engine exhaust primarily consisting of nitrogen oxide and carbon monoxide. However, the standard for nitrogen dioxide is set on an annual basis and should not be violated by emissions resulting from short-term construction activities. Carbon monoxide emissions from construction equipment and vehicles should also be low and relatively insignificant compared to vehicular emissions from nearby roadways. The use of heavy trucks during construction activities should also be limited due to the use of excavated material as fill for the project access road and Unit III subdivision site.

Construction of Kamehame Ridge Unit III Subdivision

Construction activities for the Kamehame Ridge Unit III subdivision are planned to begin about a month after excavation and grading activities for the reservoir are initiated. Therefore, potential cumulative impacts to air quality from construction activities for the Unit III subdivision will only occur during the four to six months remaining for construction of the water reservoir.

Construction activities for the Kamehame Ridge Unit III subdivision will result in fugitive dust emissions due to the excavation of approximately 240,000 cubic yards of material. However, the amount of fugitive dust emitted from both the reservoir and subdivision development should not result in State and Federal AAQS for particulate matter and PM-10 being exceeded due to the short-term nature of the activity. The Rock Land (rRK) soil classification for the subdivision site is also expected to minimize the amount of fugitive dust emitted along with a watering program.

7.4 NOISE ENVIRONMENT

The noise descriptor currently used by Federal agencies to categorize environmental noise is the Day-Night Average Sound Level (Ldn). The Ldn is a 24-hour average of instantaneous A-weighted[10] sound levels. An *exterior* noise level of 65 Ldn or lower is the national standard used by Federal agencies in determining noise acceptability for funding assistance.

7.4.1 Existing Conditions

As a general rule, noise levels of 55 Ldn or less are typically present in rural areas, or in areas located away from high traffic volume roadways. In urbanized areas that are shielded from busy streets, noise levels typically range from 55 to 65 Ldn and are usually due to vehicular traffic noise. Residences which front major roadways typically are exposed to levels from 65 Ldn to 75 Ldn. Due to noise shielding effects of nearby structures, interior house lots are usually exposed to noise levels 3 to 10 Ldn lower than homes next to roadways. Table 7.1 shows current Federal noise standards and acceptability criteria for residential land uses.

Field surveys of surrounding land uses have determined that existing residential subdivisions in Kamiloiki Valley and along Hawaii Kai Drive are probably exposed to noise levels between 55 and 65 Ldn. This level of noise is primarily due to local roadway traffic, and is considered to be a moderate level of noise exposure which is currently acceptable under Federal standards. Kamiloiki Elementary School, located along Hawaii Kai Drive, is also estimated to be exposed to similar noise levels of 55 to 65 Ldn.

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10 Community noise is often reported in A-weighted decibels. A-weighting refers to electronic measurement corrections made by sound measurement devices to adjust downwards (weight) the values for sounds outside the range of human hearing.

Table 7.1 Exterior Noise Exposure Classification
(Residential Land Use)

Noise Exposure Class	Day-Night Sound Level	Equivalent Sound Level	Federal Standard[1]
Minimal	≤ 55 Ldn	≤ 55 Leq	Unconditionally Acceptable
Moderate	> 55 and ≤ 65 Ldn	> 55 and ≤ 65 Leq	Acceptable2
Significant	> 65 and ≤ 75 Ldn	>65 and ≤ 75 Leq	Normally Unacceptable
Severe	> 75 Ldn	> 75 Leq	Unacceptable

Notes: 1. Federal Housing Administration, Veterans Administration, Department of Defense, and Department of Transportation.

2. FHWA uses the Leq instead of the Ldn descriptor. For planning purposes, both are equivalent if: a) heavy trucks don't exceed 10% of total traffic flow in vehicles per 24 hrs, and b) traffic between 10:00 pm and 7:00 am does not exceed 15% of average daily traffic flow in vehicles per 24 hrs. The noise mitigation threshold used by FHWA for residences is 67 Leq.

Source: "Guidelines for Considering Noise in Land Use Planning and Control;" Federal Interagency Committee on Urban Noise; June 1980.

7.4.2 Probable Impacts

Temporary audible construction noise will probably be unavoidable during construction activities for the water reservoir project. However, impacts from construction noise are not expected to be significant due to the temporary nature of the work, and administrative controls available for its regulation described in the Department of Health Administrative Rules.

Spec. noise level in permit?

Table 7.1 Exterior Noise Exposure Classification
(Residential Land Use)

Noise Exposure Class	Day-Night Sound Level	Equivalent Sound Level	Federal Standard[1]
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Significant	> 65 and ≤ 75 Ldn	>65 and ≤ 75 Leq	Normally Unacceptable
Severe	> 75 Ldn	> 75 Leq	Unacceptable

Notes: 1. Federal Housing Administration, Veterans Administration, Department of Defense, and Department of Transportation.

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Source: "Guidelines for Considering Noise in Land Use Planning and Control;" Federal Interagency Committee on Urban Noise; June 1980.

7.4.2 Probable Impacts

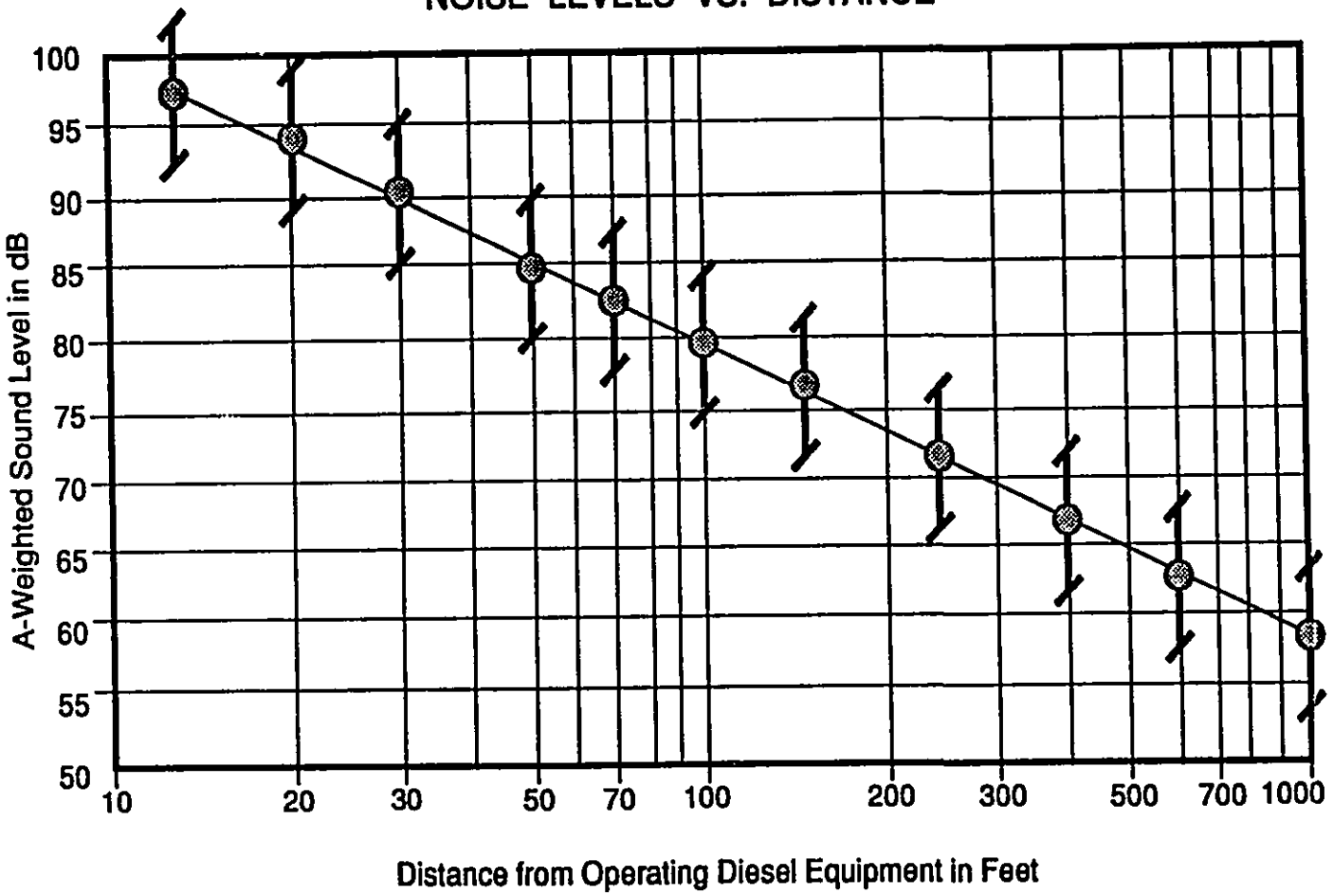
Temporary audible construction noise will probably be unavoidable during construction activities for the water reservoir project. However, impacts from construction noise are not expected to be significant due to the temporary nature of the work, and administrative controls available for its regulation described in the Department of Health Administrative Rules.

Instead, these impacts are expected to be limited to a temporary degradation in the quality of the acoustic environment in the immediate vicinity of the project site. The water reservoir construction site will be over 1,000 feet away from the nearest home, park or structure, and only a small number of trucks and equipment will be used. In addition, construction activity is expected to occur during normal work hours when most nearby residents are usually not at home. Figure 7.1 shows typical levels of noise from construction activity.

Kamehame Ridge Unit III Subdivision Construction

Construction activities for the Kamehame Ridge Unit III subdivision are planned to begin about a month after excavation and grading activities for the reservoir are initiated. Therefore, potential cumulative noise impacts from construction activities for the Unit III subdivision will only occur during the four to six months remaining for construction of the water reservoir.

In addition to the vehicles used for reservoir construction, additional vehicles will be used for construction activities at Kamehame Ridge Unit III subdivision site. Noise levels on Kamehame Ridge during this four to six month period are expected to be somewhat increased over those produced by the reservoir project. However, given the considerable distance from residences and parks, the increased noise levels are not expected to significantly affect adjacent residential areas.



PACIFIC PLANNING & ENGINEERING, INC

Source: Y. Ebisu and Associates

TYPICAL CONSTRUCTION ACTIVITY NOISE LEVELS

Figure 7.1

7.5 NATURAL HAZARDS

The Kamehame 990' Water Reservoir Project will not contribute to any impacts related to natural hazards. However, natural hazards that could potentially have an impact upon the reservoir project are volcanic eruptions, earthquakes, and hurricanes.

7.5.1 Volcanic Eruptions

Since 1790, there have been 12 reported volcanic eruptions in Hawaii. Eleven of these occurred on the island of Hawaii, and one on Maui. According to a recent Honolulu Advertiser newspaper article, there have been approximately 40 volcanic eruptions on Oahu within the past 500,000 years indicating an average of about one eruption every 10,000 years.[11] It is estimated that the most recent eruptions on Oahu occurred about 60,000 years ago, and are believed to have formed such features as Rabbit Island, Koko Head, and Hanauma Bay.

Potential impacts to the project resulting from volcanic eruptions cannot be accurately predicted with any degree of certainty. According to Professor George P. Walker of the University of Hawaii's Department of Geology and Geophysics, an eruption occurring every 10,000 or 20,000 years would be quite rare.[12] Therefore, the probability of volcanic eruptions occurring which would result in damages to the reservoir facility can be reasonably determined to be quite low. However, potential damages to the reservoir facility can be minimized by following the BWS's design standards.

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11 "Isles' older volcanoes may wake," The Honolulu Advertiser, Tuesday June 11, 1991, Section A-1, 4.

12 Op cit; see also: MacDonald, Gordon, Abbot, Agatin, and Peterson, Frank, Volcanoes in the Sea. The Geology of Hawaii, Honolulu, University of Hawaii Press, 1990, p. 452.

7.5.2 Earthquake Hazards

Earthquakes in the Hawaiian Islands are primarily associated with volcanism resulting from the inflation or shrinkage of magma reservoirs beneath the earth's crust. By comparison, tectonic or plate movement causes most earthquakes on continental regions, and is nearly absent in Hawaii. However, the Molokai Fracture Zone, which is a large system of sea-floor faults extending from the Gulf of California to the Hawaiian Islands, is located in the area between Molokai and Lanai.

The Hawaiian Islands are currently not subject to numerous earthquakes except for the island of Hawaii. Oahu periodically experiences episodes of seismic activity, however, most of the quakes are too weak to be felt. It is also unlikely that one would be large enough to cause significant damage.

A few large earthquakes did affect Oahu during historic times. According to a 1986 study by Cox,[13] the Lanai Earthquake of February 1871, with a Richter scale magnitude of approximately 7.0, is considered the most significant recorded earthquake in the State. The Lanai earthquake caused landslides and rockfalls, and damages to buildings and furniture. It is believed that the Oahu Earthquake of June 1948 was the second largest recorded earthquake. This quake caused the cracking of masonry walls and the breakage of residence windows.

Available historical data indicate that major earthquakes occurring on Oahu have generally been less frequent and of lower magnitude than those occurring on other Hawaiian Islands. However, earthquakes cannot be predicted with any degree of certainty, nor can they be avoided. It is possible that a large earthquake (greater than 5.0 on the Richter Scale) could cause some damage to the water reservoir project along with residences and buildings in the surrounding region. Potential damages should be minimized by following appropriate BWS design and construction standards, and by regularly maintaining the facilities.

13 D.C. Cox, Earthquakes Felt on Oahu, Hawaii, and Their Intensities, Environmental Center, University of Hawaii, 1986.

7.5.3 Hurricane Hazards

Hurricanes which pose a threat to the Hawaiian Islands are classified as Critical Hurricanes. A 1985 Hurricane Vulnerability Study for Honolulu and Vicinity prepared by the U.S. Army Corps of Engineers (USACE) researched all recorded hurricanes between 1950 and 1983.[14] Of all hurricanes recorded during the study period, 20 were determined to be Critical Hurricanes. Of these, seven either struck, came close to, or posed an extreme threat to the State. The most threatening were Hurricane Dot, which passed over the island of Kauai in 1959, and Hurricane Iwa which passed within 30 miles of Kauai in 1982.

The three major elements of a hurricane that make it hazardous are: 1) high winds; 2) waves and storm surge; and 3) heavy rainfall. Because the project site is located a considerable distance from ocean and at such a high elevation, the threat to the project from waves and storm surge is probably unrealistic.

The USACE study determined that the potential for heavy rainfall resulting from hurricanes is no greater than that resulting from extreme Kona storms. Thus, heavy rainfall should not pose a significant threat to the reservoir facility because the drainage design for the facility will take into account the City and County of Honolulu's design standards for a 100 year storm. Therefore, the most likely hurricane element having the potential to cause damages to the reservoir facility is high wind speeds which may exceed 100 miles per hour near the center of the eye. High wind speeds should not cause significant damage to the reservoir due to the design elements of a circular tank and use of concrete for the facility. Minor damages to accessory facilities, such as fencing, may occur but should be minimized by following BWS design standards.

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14 U.S. Army Corps of Engineers, Pacific Ocean Division, Hurricane Vulnerability Study for Honolulu, Hawaii and Vicinity , 1985.

7.6 VISUAL RESOURCES

Field studies and research were conducted to determine probable visual impacts to Kamehame Ridge resulting from the proposed water reservoir project. A Coastal View Study (CVS) prepared for the City and County of Honolulu Department of Land Utilization[15] classifies Kamehame Ridge as an important coastal land form, making it a prominent feature within the coastal view. As a result, visual impacts are assessed based upon potential infringements to the existing visual quality of Kamehame Ridge.

7.6.1 Study Methodology

The concept of *viewsheds* from the CVS is utilized to identify the visual resources associated with Kamehame Ridge. This concept is defined in the CVS as the entire surface area visible to an observer from a viewing point. Based upon field surveys, views of the land patterns of Kamehame Ridge from locations to the east and west of the Ridge were determined to be valued scenic resources. These views were identified as the eastern and western viewsheds of Kamehame Ridge, and were used to assess potential impacts to the visual quality of the viewsheds resulting from the proposed project.

To measure changes to the visual qualities associated with the eastern and western viewsheds of Kamehame Ridge, the concepts of visual 'Vividness,' 'Intactness,' and 'Unity' described in the CVS are used. These concepts describe the visual qualities of the viewsheds in terms of low, moderate, and high visual qualities.

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15 Chu, Michael,S. and Jones, Robert B., Coastal View Study, City and County of Honolulu Department Of Land Utilization, 1987 .

Visual *vividness* is derived from contrasting landscape components as they combine to create distinctive visual patterns, taking into account form, line, texture and color. Visual *intactness* refers both to the integrity of visual pattens and the extent to which the landscape is free from visually encroaching features. Visual *unity* is the degree to which the visual resources of the landscape join together to form a coherent, harmonious visual pattern. The key criterion of unity is the composition and balance between man-made and natural pattern elements.

7.6.2 Existing Conditions

Visual field surveys of the eastern viewshed of Kamehame Ridge were conducted from sites along Kalanianaole Highway near Queen's Beach and Makapuu Head near the Coast Guard road. In addition, visual surveys were conducted from locations at Sandy Beach, Queen's Gate subdivision, and Kalama Valley Shopping Center. However, the view of Kamehame Ridge from Kalanianaole Highway between Makapuu Head (Coast Guard Road) and Makapuu Lookout could not be seen because of an existing ridge blocking most of the view. As a result, the visual survey from this location was determined to be inappropriate and not used in the visual impact analysis.

Visual surveys of the western viewshed of Kamehame Ridge were conducted from Kalanianaole Highway near Koko Marina Shopping Center, and from stationary locations at Kamiloiki Elementary School and Kamiloiki Community Park.

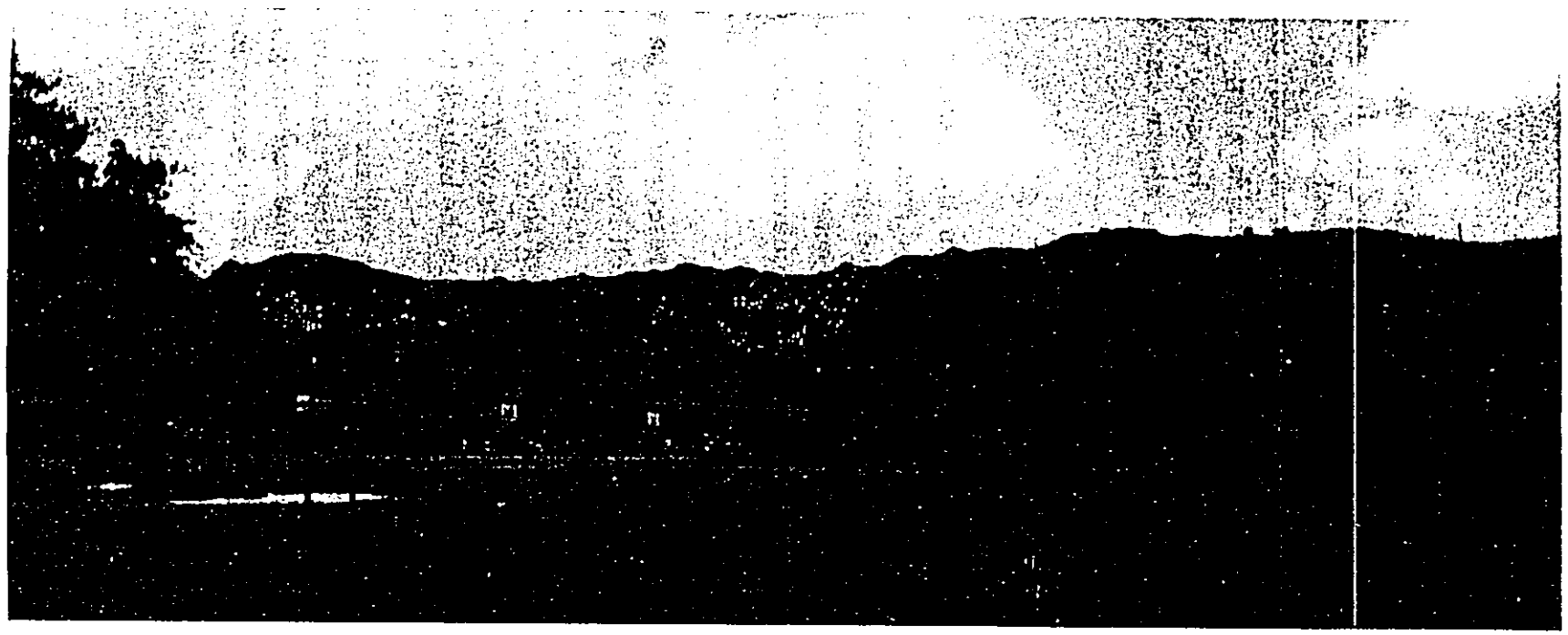
Eastern Viewshed of Kamehame Ridge

The existing eastern viewshed of Kamehame Ridge was determined to have high visual vividness, intactness, and unity. The single-family residences of Kalama Valley located below the Kamehame Ridge contrast with the ridge's natural terrain and features creating a distinctive pattern and view resulting in high visual vividness. With the exception of two electrical sub-transmission poles located on the ridge near the Na Pali Haweo subdivision, the view is generally free of encroaching features resulting in high visual intactness. The visual unity of the viewshed is also high due to the harmonious pattern and balance created by Kamehame Ridge and the subdivision below. Figure 7.2 shows a photograph of the eastern viewshed from the Queen's Gate subdivision.

Western Viewshed of Kamehame Ridge

The existing western viewshed of Kamehame Ridge was also determined to have high visual vividness, intactness, and unity. As with the eastern viewshed, single-family residences and Kamiloiki Community Park contrast with the natural terrain and features of the ridge, creating a distinctive visual pattern resulting in high visual vividness. The visual intactness of the viewshed is also high because the ridge is generally free from encroaching features, although an existing 1.5 mg water reservoir at the 500' elevation does diminish the visual quality slightly (existing 820' and 170' reservoirs are not visible). The visual unity of the viewshed is also high due to the harmonious pattern and balance created by the ridge and subdivision located below. Figure 7.3 shows a photograph of the western viewshed taken from Kamiloiki Elementary School.

PACIFIC PLANNING & ENGINEERING, INC	KAMEHAME RIDGE EASTERN VIEWSHED	Figure 7.2



PACIFIC PLANNING & ENGINEERING, INC

KAMEHAME RIDGE WESTERN VIEWSHED

Figure 7.3

7.6.3 Probable Impacts

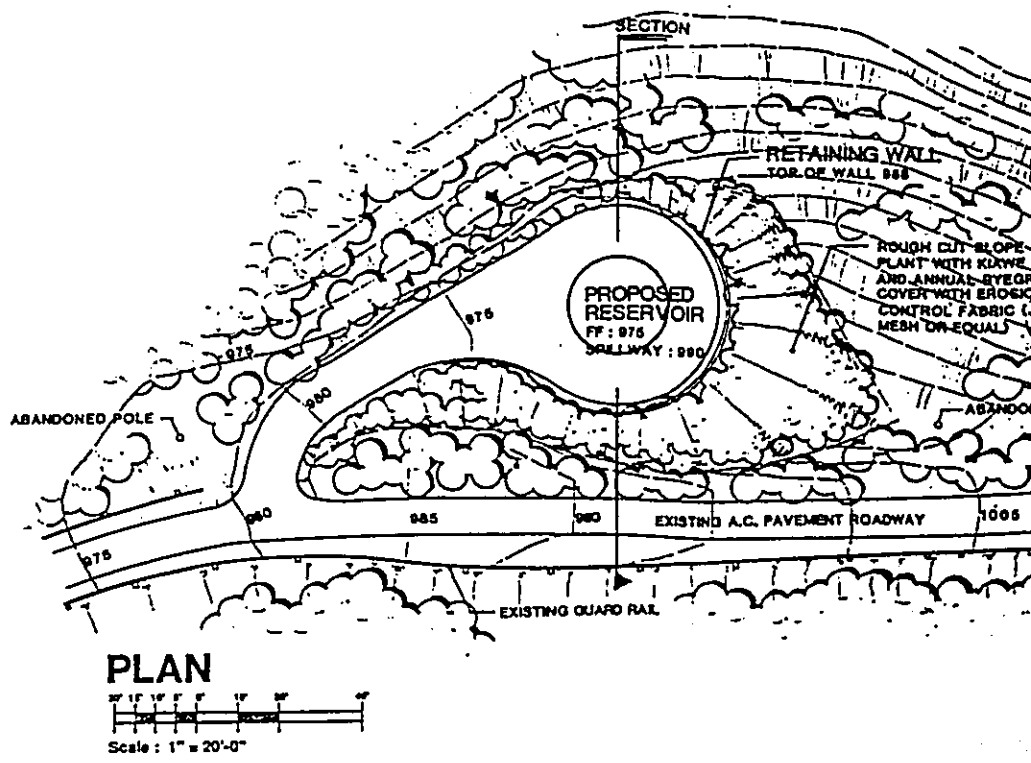
Visual impacts resulting from the proposed Kamehame 990' Water Reservoir Project were assessed based upon the significance of change to the vividness, intactness and unity of the viewsheds. The assessment of impacts were generally based upon the water reservoir tank, because it would be the most visible feature, however, consideration also was given to accessory facilities such as the instrument house. The conceptual landscape plan for the water reservoir project, shown on Figure 7.4, was incorporated into the visual assessment.

Visual Impacts to Eastern Viewshed

The water reservoir should not be visible in the eastern viewshed from survey sites along Kalanianaole Highway and from stationary survey sites based upon the conceptual landscape plan and proposed siting on the ridge. As a result, the reservoir project is not expected to have an impact to the visual vividness, intactness, and unity characteristics of the eastern viewshed of Kamehame Ridge.

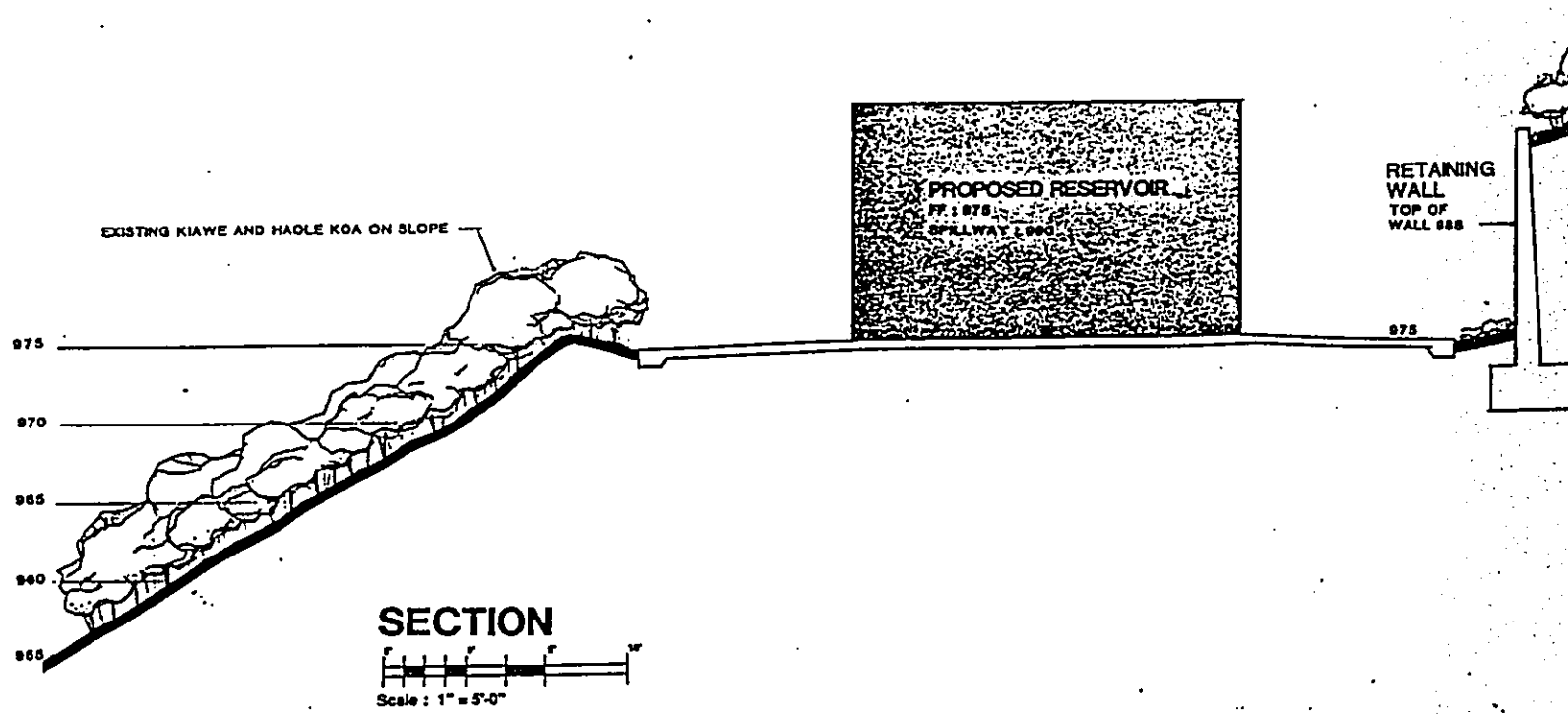
As shown on the landscape plan, the water reservoir will be situated at the 975' elevation level adjacent to a bedrock knoll located west of a private road which is an extension of Kamehame Drive. A large portion of the knoll is higher than the 990-foot spillway elevation of the reservoir, therefore it will block the view of the reservoir from the east. Figure 7.5 shows photographs of the proposed reservoir site, situated next to the bedrock knoll.

The proposed 0.1 mg water reservoir's size will make its visibility in the landscape very unlikely. In addition, existing vegetation and proposed landscaping for the reservoir will provide visual screening from eastbound views of the ridge. Therefore, the existing knoll, vegetation on the ridge, and proposed landscaping are expected to block the view of the water reservoir from the eastern viewshed of Kamehame Ridge.



PLAN

Scale : 1" = 20'-0"



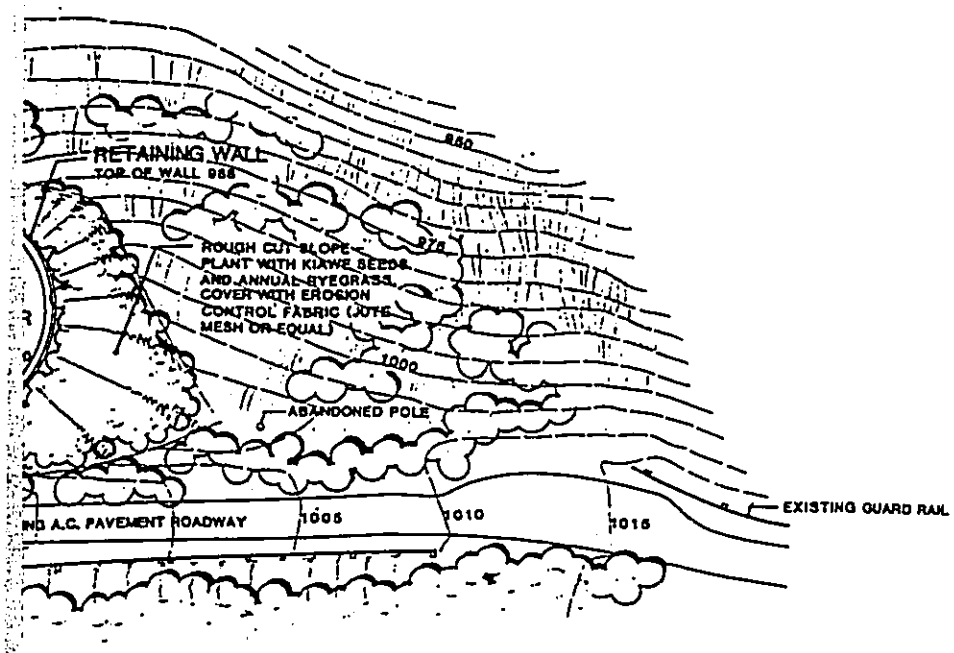
SECTION

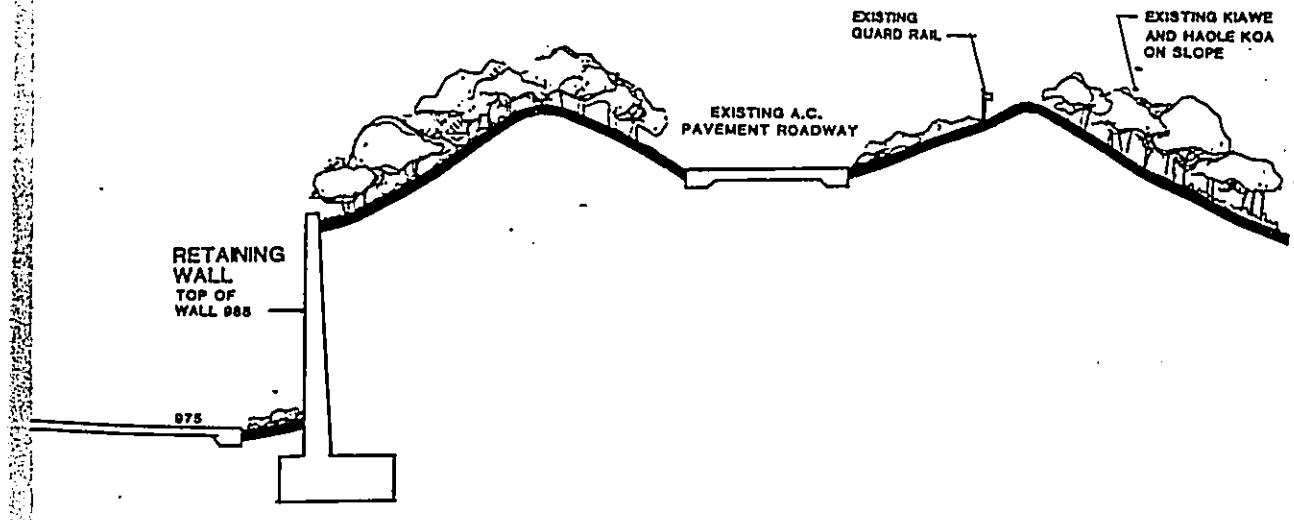
Scale : 1" = 5'-0"

PACIFIC PLANNING & ENGINEERING, INC

Source: Belt Collins & Associates

LANDSCAPE P

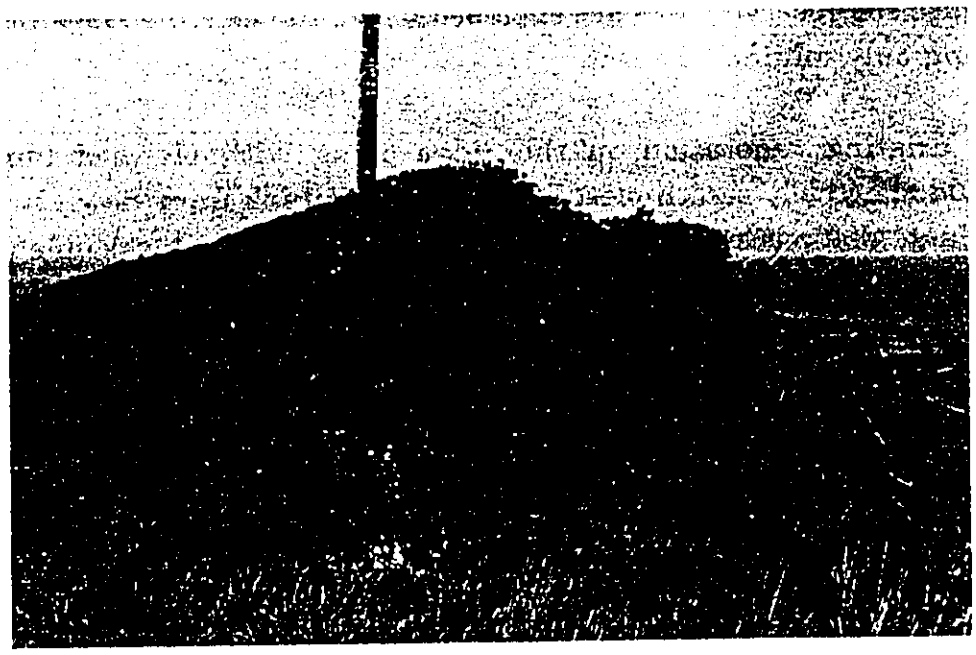




LANDSCAPE PLAN

Figure 7.4

Mauka (North) View of Rock Knoll & Reservoir Site from Nike Road



Makai (South) View of Rock Knoll & Reservoir Site

PACIFIC PLANNING & ENGINEERING, INC	VIEW OF PROPOSED RESERVOIR SITE WITH KNOLL	Figure 7.5

Visual Impacts to Western Viewshed

The water reservoir is not expected to be visible in the western viewshed from Kalanianaole Highway near Koko Marina Shopping Center due to considerable distance and relatively small size of the facility. Portions of the water reservoir may be visible in the western viewshed of Kamehame Ridge from survey sites at Kamiloiki Elementary School and Kamiloiki Community Park. However, the proposed water reservoir project is expected to have minimal impact to the existing visual characteristics of the viewshed.

The visual vividness and unity of the western viewshed may be slightly diminished because the water reservoir facility is not as visually congenial a land use as parks and single-family homes. However, the viewshed's existing high visual quality is expected to be retained because only the upper portion of the reservoir tank would be visible in the western viewshed (Figure 7.4). The visual intactness of the viewshed should also remain high because the reservoir will not encroach above the existing ridgeline thereby having only minimal impact.

The existing vegetation on the ridge along with planned landscaping should effectively screen most of the reservoir tank from view. In addition, the large distances of the reservoir site from survey sites coupled with the size of the reservoir tank is expected to make it very difficult to see. The reservoir tank will also be painted an earth-tone color to blend in with the surrounding landscape of Kamehame Ridge further minimizing its visual impacts.

Viewsheds with Na Pali Haweo and Unit III Subdivisions

Consideration was also given to potential visual impacts to the Kamehame Ridge eastern and western viewsheds with the construction of single-family homes along with the water reservoir project. The construction of Na Pali Haweo and Kamehame Ridge Unit III subdivisions on top of the Ridge are not expected to greatly diminish the existing visual characteristics of the eastern and western viewsheds. The homes constructed are expected to be compatible and harmonious with existing land uses (other homes) located on the Ridge and in the surrounding area. As a result, the visual pattern and balance between man-made and natural elements should be retained with the construction of homes. Therefore, the high visual vividness, intactness, and unity characteristics associated with the viewsheds should be maintained even with both the water reservoir project and the subdivision developments.

7.7 FLORA AND FAUNA

7.7.1 Flora

The major findings and recommendations from a botanical assessment report prepared by Char & Associates for the proposed project are discussed below, and the report is included in its entirety as Appendix B. A field study was conducted on September 17, 1991 at the proposed water reservoir site by Char & Associates. Notes were made of the general vegetation in the area, and a search was conducted for threatened and endangered plants in the area.

Existing Conditions

Vegetation on Kamehame Ridge consists principally of low (3 to 7 foot tall), windswept koa-haole shrubland. Scattered throughout this koa-haole shrubland are kiawe trees, klu shrubs and Christmas berry. The most abundant grass is Guinea grass which forms a dense ground cover. Other grass types found were pitted beardgrass, sour grass, and Natal redtop.

Along the existing private road, and on rocky outcroppings, annual weedy species and other grass species are more common. These include beggar's tick, virgate mimosa, pitted beardgrass, Natal redtop, partridge pea, fuzzy rattlepod, and swollen finger grass.

Scattered clumps of native plant species are present on the project site. These natives occur widely throughout the Hawaiian Islands in similar habitats.

The vegetation around the proposed water reservoir site is dominated primarily by introduced or alien species such as koa-haole and Guinea grass. None of the native species which occur along this part of Kamehame Ridge are officially listed threatened and endangered species (U. S. Fish and Wildlife Service 1989); nor are any proposed or candidate for such status (U.S. Fish and Wildlife Service 1990).

Probable Impacts

The proposed water reservoir and access road are not expected to have a significant negative impact on the botanical resources of the Kamehame Ridge area or the flora of the Hawaiian Islands because the majority of species found around the site are introduced and not endangered. As a result, there are no botanical reasons to impose any restrictions, impediments or conditions on the proposed project, and therefore no mitigation measures are needed.

7.7.2 Fauna

The project area does not have any significant features such as wetlands that are well-suited for bird habitats, and the proposed project will not change the physical geography of the area, nor impact existing flora.[16] As a result, resident endemic and indigenous birds along with migratory birds which may be inhabiting the area are not expected to be impacted by the water reservoir project. Similarly, feral mammals such as wild cats, rats or mongoose which potentially may be found in the area are not expected to be impacted by the reservoir construction or operation.

7.8 HISTORIC AND ARCHAEOLOGICAL RESOURCES

An archaeological survey of the Kamehame Ridge water reservoir site was conducted by Cultural Surveys Hawaii (CSH). The survey findings are discussed below, and their report is included in its entirety as Appendix C.

7.8.1 Introduction

A field crew of archaeologists conducted a survey of the proposed Kamehame 990' Water Reservoir site. The purpose of the survey was to locate, describe and evaluate archaeological sites within specific impact areas such as water tank, and access road. In addition, the scope of work included a review of historical background literature and previous archaeological research. The survey procedure consisted of walking up the private road to the proposed water reservoir site on Kamehame Ridge, and across the reservoir location. Photographs and notes were taken during the field survey to record the existing conditions at the project area.

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16 Char & Associates, Botanical Assessment Survey, Kamehame Ridge Water Reservoir, Honolulu District, Island of Oahu, Botanical Consultant Report, September 1991.

7.8.2 Existing Conditions

Archaeological research specific to Kamehame Ridge includes two reports prepared by Kanalei Shun of Archaeological Associates Oceania (Shun 1988 and 1990). These reports are inventory level surveys, with one performed for Kamehame Ridge Unit II subdivision (1988) and the other for Na Pali Haweo Transmission Line (1990). The results of these reports determined that no historical sites of any kind were identified in the surveyed areas.

Shun suggested three general reasons for the absence of archaeological sites in the higher elevations (200+ feet) of Kamehame Ridge. These are: 1) distance from the ocean, 2) distance from available fresh water, and 3) "the restrictive natural topography of the ridge, one that does not allow for large cliff overhangs, caves or lava tubes" (Shun, 1988).

Other previous archaeological research also indicates an absence of archaeological sites along the higher elevation slopes of ridges in the Maunalua area. Though there have been reported rock shelter sites at Kuliouou (Emory and Sinoto 1961) and burial caves on Kaluanui Ridge (Sites 50-10-15-2902 and 2908), these were found at lower elevations (60 to 100 feet) along the ridge and were located closer to the ocean than the proposed reservoir project site.

Based upon the field surveys conducted by Cultural Surveys Hawaii, no archaeological sites were observed at the water reservoir project site. There were no overhangs of a size sufficient for habitation observed. The terrain is mostly crumbly, weathered basalt which appears to be subject to periodic slope wash during heavy rains. As a result, these terrain factors and observed absence of suitable overhangs suggest a very low probability of any sites in the proposed water reservoir project area.

7.8.3 Probable Impacts

Conspicuously absent from discussions concerning Maunalua is the mention of any archaeological sites associated with the upper slopes of ridges in the area. Ridge-associated sites like overhang shelters and burial caves (overhangs) are known to exist, but are generally located at lower elevations and closer to Kuapa Pond or the ocean. The present survey included a search for similar overhang-type features, but none were reported for Kamehame Ridge. Therefore, no further archaeological work is recommended for the proposed water reservoir and access road area, due to the absence of any observed archaeological sites. However, in the event any archaeological sites are discovered during construction, appropriate agencies should be notified immediately.

SECTION 8.0
SOCIAL - ECONOMIC FACTORS

8.1 SOCIAL FACTORS

The water reservoir project will not directly increase the resident population in the Hawaii Kai area, however, it would support the planned Kamehame Ridge Unit III subdivision development. The subdivision's 33 house lots may increase the population in the Hawaii Kai area by approximately 112 residents based upon information provided in the 1990 State of Hawaii Data Book.[17] With a resident population of over 28,600 in the Hawaii Kai region, the Unit III subdivision would result in a population increase of less than 0.4 percent, and have minimal impact to the region's population density.

The increase in population should not change the existing character or culture of the Kamehame Ridge neighborhood. Future residents of the Unit III subdivision are expected to be full-time residents with characteristics generally similar to existing homeowners in the neighborhood.

8.2 ECONOMIC FACTORS

The proposed water reservoir project should not have any impact to businesses in the surrounding area due to the location of the reservoir site on top of Kamehame Ridge. The project is expected to have a positive impact to the island's employment base because it will create job opportunities for a minimum of six full-time construction workers for approximately six months. Wages generated by these employment opportunities along with money spent for construction and development fees will increase State Income and Excise Tax revenues. The reservoir project will support the Unit III subdivision, and enhance property values of individual Unit III house lots which should contribute to increased Real Property Tax revenues to the City and County of Honolulu.

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17 Department of Business, Economic Development & Tourism, The State of Hawaii Data Book 1990.

SECTION 9.0
INFRASTRUCTURE AND PUBLIC FACILITIES

9.1 TRAFFIC

9.1.1 Existing Conditions

Vehicular access to the water reservoir project site is from a private road leading to the top of the ridge. This road begins at Kamehame Drive which currently provides vehicular access to the recently completed Na Pali Haweo subdivision. Upon completion of the future Kamehame Ridge Unit III subdivision, this private road will begin from the end of Kamehame Drive which will be extended to provide vehicular access to the Unit III subdivision.

Kamehame Drive is a two-laned roadway connecting to Hawaii Kai Drive via Maunanani Street, and is the primary road providing vehicular access to residential units located on Kamehame Ridge. Hawaii Kai Drive is a 4-laned roadway generally running in an east-west direction in the vicinity of the project site. A major intersection located in the vicinity of the project site is the signalized intersection of Hawaii Kai Drive with Lunalilo Home Road. Another major intersection in the immediate vicinity is Hawaii Kai Drive with Kealahou Street which is a 3-way stop controlled intersection.

9.1.2 Probable Impacts

Potential impacts to traffic conditions in the vicinity of the project will primarily be associated with short-term construction-related traffic. The project should not result in any significant long-term impacts to traffic conditions in the area because vehicle trips will not be generated by the water reservoir with the exception of occasional maintenance conducted by BWS staff. As a result, the assessment focused upon potential impacts to traffic conditions associated with construction activity.

Construction activities resulting from the water reservoir project are expected to have minimal impact on traffic flow along Hawaii Kai Drive, and at the intersections of Hawaii Kai Drive with Lunalilo Home Road and Kealahou Street. Six full-time workers are needed during construction activities which should result in no more than 6 additional vehicles a day along Hawaii Kai Drive during both the morning and evening commuter peak periods. Vehicle trips generated by heavy trucks associated with grading and construction activities are also not expected to have a significant impact to traffic flow. The excavated material is expected to be used as fill onsite, minimizing the number of vehicle trips on the surrounding roadways. The majority of roadway trips generated by construction vehicles should also occur during non-commuter peak periods, further minimizing the impact to traffic flow on nearby roadways. Access along the private road will also remain open to other authorized users, preventing possible impacts to the accessibility of facilities located above the reservoir site such as FAA or hang-gliding facilities.

Construction of Kamehame Ridge Unit III Subdivision

Construction of the Kamehame Ridge Unit III subdivision will occur about one month after construction activities for the water reservoir project are initiated. Potential cumulative traffic impacts should only occur for the remaining four to six months of reservoir construction.

Construction activities for the Unit III subdivision will result in increased vehicular traffic on the surrounding roadways. However the amount of vehicles added to the traffic from both the reservoir and subdivision development should not significantly impact traffic flow on surrounding roadways or intersections because these vehicles are expected to be travelling during non-commuter peak hours, and will only be temporary. In addition, most of the heavy vehicles needed will be used for both the Unit III subdivision and water reservoir construction activities thereby minimizing the number of vehicles added to the surrounding roadways.

9.2 ELECTRICAL SYSTEMS

9.2.1 Existing Conditions

Hawaiian Electric Company, Inc. has two 46 kV sub-transmission lines routed over the Koolau mountain range along the slopes of Kamehame Ridge from the Kamiloiki Substation located along Hawaii Kai Drive. These sub-transmission lines provide electrical service to residents on Kamehame Ridge and in the Hawaii Kai region. Near the proposed site for the water reservoir, there are two abandoned sub-transmission poles located mauka (north) and makai (south). Plans to relocate an existing 46 kV sub-transmission line from the eastern slope of Kamehame Ridge to the ewa (western) slope of the Ridge are currently being processed by DLNR.

9.2.2 Probable Impacts

The water reservoir project will not have any impact on existing electrical sub-transmission lines and poles along Kamehame Ridge, or to electrical service to residents in Hawaii Kai. Existing sub-transmission lines and poles are located over 250 feet away from the reservoir site, and therefore reservoir construction activities should not impact them. The completed realignment of sub-transmission lines resulting from the sub-transmission line relocation project will not impact construction activities for the reservoir because the realignment will be completed before construction of the water reservoir begins and will be located an adequate distance from the reservoir site.

A connection will be made between the reservoir's instrument house and Unit III subdivision distribution lines when infrastructure for the subdivision is installed. Overall electrical consumption for water level recording and telemetry instruments contained in the instrument house will be minimal and easily accommodated by HECO.

9.3 COMMUNICATION SYSTEMS

9.3.1 Existing Conditions

The Federal Aviation Administration (FAA) operates a communications facility for monitoring aircraft located near the top of Kamehame Ridge. The facility is unmanned, and is generally maintenance free, with little or no activity occurring on the site. Other unmanned communication facilities operated by private companies are also located on top of Kamehame Ridge.

9.3.2 Probable Impacts

The proposed project is not expected to have any long-term impacts to these facilities. Short-term impacts resulting from reservoir and road construction activities should not affect vehicular access, because the private road will remain open, and noise generated by construction vehicles is not expected to impact the operation or maintenance of these facilities.

9.4 RECREATIONAL FACILITIES

9.4.1 Existing Conditions

Kamiloiki Neighborhood Park and Kamiloiki Community Park are County parks providing playgrounds and recreational activities for residents of Kamiloiki Valley and other nearby neighborhoods. Kamiloiki Neighborhood Park is located on Lunalilo Home Road at the foot of Kamehame Ridge below the project site. Kamiloiki Community Park is located adjacent to Kamiloiki Elementary School on Hawaii Kai Drive. Other nearby recreational facilities are the Kamiloiki Community Center in upper Kamiloiki Valley, and the recently completed Na Pali Haweo Park.

Hang-gliding activities also take place from the very top of Kamehame Ridge overlooking Waimanalo Bay. Only organizations and individuals that have received prior authorization from Bishop Estate are allowed to participate in hang-gliding activities from Kamehame Ridge. Hang-gliders are the only recreational users permitted on top of Kamehame Ridge. Discussions with Bishop Estate have indicated that approximately 120 hang-gliding trips occur each month with 75 percent (90) of them occurring during the weekends.

9.4.2 Probable Impacts

The proposed water reservoir project is not expected to have significant long-term impacts to County park facilities in the project vicinity. Short-term construction activities may result in increased noise levels and fugitive dust, however, these temporary impacts are expected to be minor, as discussed in sections 7.3 and 7.4. Reservoir construction activities should occur on weekdays during normal work hours when these facilities are used less.

The proposed project is not expected to have any short or long-term impacts to hang-gliding activities occurring on top of Kamehame Ridge. Construction activities for the water reservoir project should occur on weekdays during normal work hours when the frequency of hang-glider use is lowest. Vehicular access to hang-gliding sites on Kamehame Ridge from the private road is not expected to be affected by reservoir construction activities.

9.5 EDUCATIONAL FACILITIES

9.5.1 Existing Conditions

The only educational facility located in the immediate vicinity of the project site is Kamiloiki Elementary School, located on the southwestern foot of Kamehame Ridge adjacent to Hawaii Kai Drive. During the 1990 school year, Kamiloiki Elementary School had a total enrollment of 632 students. Projected enrollments for school years 1991 and 1992 are 631 and 627 students, respectively.[18] The school has five buildings comprised of classrooms, administration facilities, a cafeteria, and a library.

9.5.2 Probable Impacts

The proposed Kamehame 990' Water Reservoir Project should not result in any significant short or long-term impacts to the school. Potential construction-related impacts are expected to be minimal and temporary, primarily because of the large distance between the school and project site. These potential impacts are discussed in sections 7.3 and 7.4 of this report.

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18 Office of Business Services, Department of Education Enrollment Projections of the Public Schools of Hawaii, 1991-1996, May 1991

SECTION 10.0
RELATIONSHIP OF PROPOSED PROJECT TO STATE AND COUNTY PLANS

The relationship between the proposed project and the goals, objectives and policies expressed in the Hawaii State Plan, State Functional Plans, State Environmental Policy, City and County of Honolulu General Plan and Development Plans were assessed and are discussed in this section.

The Kamehame 990' Water Reservoir Project is compatible with the objectives and policies of State and County land use plans and policies. Sections from various land use plans that were determined to be relevant to the proposed project are discussed below.

10.1 HAWAII STATE PLAN

The Hawaii State Plan, Chapter 226, Hawaii Revised Statutes, consists of a series of broad goals, objectives, and policies which serve as guidelines for the future growth and development of the State of Hawaii. The Hawaii State Plan is divided into three parts of which Part I (Overall Theme, Goals, Objectives and Policies) are directly related to the proposed project.

The Hawaii State Plan has derived three principles or values which establish the overall theme of the plan. These principles are: 1) Individual and family self-sufficiency, 2) Social and economic mobility, and 3) Community or social well-being. To guarantee the elements of choice and mobility which insure individuals and groups of approaching their desired levels of self-reliance and self-determination, three State goals were developed. From these goals, objectives and policies addressing more specific areas were developed. These State goals are:

1. A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawaii's present and future generations;

2. A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people; and
3. Physical, social, and economic well-being, for individuals and families in Hawaii, that nourishes a sense of community responsibility, of caring, and of participation in community life.

State Objectives and Policies

SEC. 226-5 Objectives and Policies for Population

Objectives: Guide population growth to be consistent with the achievement of physical, economic and social objectives contained in this chapter.

Policies: (3) Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the state.

Comments: The proposed water reservoir project will assist in ensuring dependable and efficient domestic water service to residents in the area and an adequate supply of water for fire protection.

SEC. 226-11 Objectives and policies for the physical environment: land-based, shoreline, and marine resources.

Objectives: Planning for the State's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:
(2) Effective protection of Hawaii's unique and fragile environmental resources.

Policies: (3) Take into account the physical attributes of areas when planning and designing activities and facilities.
(8) Pursue compatible relationships among activities, facilities, and natural resources.

Comments: The proposed water reservoir project will be compatible with existing land uses and resources in the area. The design of the reservoir project took into account the physical attributes of Kamehame Ridge, and does not foreclose the possibility of other future uses around the site. Based on the results of studies undertaken for this report, the project should not result in any significant noise, air quality, or traffic impacts. No significant biological or archaeological resources are expected to be affected.

SEC. 226-12 Objectives and policies for the physical environment - scenic, natural beauty, and historic resources.

Objectives: Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawaii's scenic assets, natural beauty, and multi-cultural/historical resources.

Policies: (3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

Comments: The water reservoir's visual impacts to Kamehame Ridge are expected to be minimal, because of the relatively small size of the reservoir, and its large distance from Kalanianaole Highway and stationary scenic view sites. In addition, the reservoir will be appropriately landscaped to enable it to blend with the natural characteristics of the ridgeline. The project design also took into account the physical attributes of Kamehame Ridge, thus resulting in minimal physiographic or geologic changes to the ridge.

SEC. 226-13 Objectives and policies for the physical environment - land, air, and water quality.

Objectives: Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives:

(1) Maintenance and pursuit of improved quality in Hawaii's land, air, and water resources.

(2) Greater public awareness and appreciation of Hawaii's environmental resources.

Policies: (5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.

Comments: The proposed water reservoir project is not expected to be a potential hazard to surrounding homes because of its considerable distance and its relatively isolated site. The proposed project will extend water and fire protection services to the Unit III subdivision on Kamehame Ridge. The proposed project will incorporate appropriate BWS design and construction standards, which should minimize potential damages to the facility resulting from natural hazards.

SEC. 226-19 Socio-Cultural Advancement - Housing

Objectives: Planning for the State's socio-cultural advancement with regard to housing.

Policies: (6) Facilitate the use of available urban lands to accommodate the housing needs in various communities.

Comments: The proposed water reservoir project will facilitate and support the use of urban lands in the Hawaii Kai area for residential uses. This will be accomplished by providing a dependable and efficient water supply to meet the domestic and fire protection needs of the future residents of Kamehame Ridge.

10.2 STATE FUNCTIONAL PLANS

The State Functional Plans are intended to provide more detail to the Hawaii State Plan by focusing on twelve specific areas of concern such as agriculture, conservation lands, energy, and housing. A functional plan sets forth the policies, programs and projects designed to implement the objectives of a specific field of activity or program. Objectives and policies which were determined to be relevant to the proposed project are discussed below.

10.2.1 State Conservation Lands Functional Plan

Management of Natural Resources

A. Objective: Effective protection and prudent use of Hawaii's unique, fragile, and significant environmental and natural resources.

Policies: (1) Exercise an overall conservation ethic in the use of Hawaii's resources by protecting, preserving, and conserving the critical and significant natural resources of the State of Hawaii and controlling use of hazardous areas.

Comments: The project site is not a critical natural resource of the State which should be preserved because the site: 1) is not a primary watershed or recharge area due to the historical low annual rainfall, 2) does not have historic or cultural sites, 3) does not have endangered plants or wildlife, 4) is not frequently subject to natural hazards such as flooding, and 5) is not sensitive to reductions in water and air quality. Studies conducted have also concluded that the proposed project will not have significant long-term impacts to the existing environment and natural resources.

Protection of Endangered Species

B. Objectives: Protection of rare or endangered species and habitats native to Hawaii.

Policies: (1) Protect and preserve habitats of rare and endangered wildlife.
(2) Protect and preserve unique native plant species.

Comments: Studies conducted for this report have concluded that the project site and immediate area do not have any plants, habitats, or wildlife which are rare or endangered.

10.2.2 State Water Resources Development Functional Plan

Management of the Resource

B. Objective: Maintain the long-term availability of freshwater supplies, giving consideration to the accommodation of important environmental values.

Policies: (1) Promote sound watershed and aquifer management practices.
(3) Seek a balance among developmental and environmental values in the planning, evaluation, permitting, and construction of water resources projects.

Comments: Based upon the analysis results conducted in Section 7.2, the reservoir project will not significantly impact existing water sources or the BWS's ability to provide reliable service. This is further substantiated by the BWS's approval of the Water Master Plan for Kamehame Ridge.

Water for Municipal Use

D. Objective: Assure Adequate Municipal Water Supplies for Planned Urban Growth.

Policies: (1) Promote the planning and development of new water supplies, giving priority support to areas experiencing critical water problems.

Comments: The Kamehame Ridge Unit III subdivision site is currently designated for residential use on the County Development Plan Land Use Map. Therefore, the water reservoir project will help assure adequate and reliable water service for the subdivision.

10.3 CHAPTER 344 STATE ENVIRONMENTAL POLICY

The purpose of this chapter is to establish a state policy which will encourage productive and enjoyable harmony between man and his environment.

SEC. 344-3 Environmental Policy

Policies: (1) Conserve the natural resources, so that land, water, mineral, visual, air and other natural resources are protected by controlling pollution, by preserving or augmenting natural resources, and by safeguarding the State's unique natural environmental characteristics in a manner which will foster and promote the general welfare, create, and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of the people of Hawaii.

Comments: The studies conducted in this EA report have concluded that the water reservoir project will not have significant long-term impacts to the existing environment and natural resources.

SEC. 344-4 Guidelines

(1) Population

Guidelines: (A) Recognize population impact as a major factor in the environmental degradation and adopt guidelines to alleviate this impact and minimize future degradation.

Comments: As discussed in the section on social impacts, the reservoir project will support the development of the Kamehame Ridge Unit III subdivision. However, the increase in residents will not significantly change the existing total population in the East Honolulu region. This increase should not exceed population guidelines set in the County's Development Plan.

(2) Land, water, mineral, visual, air, and other natural resources

Guidelines: (D) Encourage management practices which conserve and protect watersheds and water sources, forest, and open space areas.

Comments: The water reservoir project will not impact existing water sources or open spaces in the immediate area.

(3) Flora and fauna

Guidelines: (A) Protect endangered species of indigenous plants and animals and introduce new plants or animals only upon assurance of negligible ecological hazard.

Comments: Flora and fauna studies conducted have determined that there are no endangered plant or animal species located within the area that may be impacted by the reservoir project.

(4) Parks, recreation, and open space

Guidelines: (A) Establish, preserve and maintain scenic, historic, cultural, park and recreation areas, including the shoreline, for public recreational, educational and scientific uses.

Comments: The proposed reservoir project will not conflict with this guideline because the site is not used or suitable for recreational, educational, or scientific uses due to the existing physiography. An archaeological study also determined that there are no historic or cultural sites which may be impacted by the reservoir project. The project is not expected to significantly change the existing high visual characteristics associated with the view of Kamehame Ridge, which is an important visual landform.

10.4 GENERAL PLAN FOR CITY & COUNTY OF HONOLULU

The General Plan for the City and County of Honolulu is a written commitment by the City and County government to a future for the island of Oahu which it considers desirable and attainable. The General Plan is also a requirement of the City Charter.

The General Plan (1988) is a two-fold document which first has statements of long-range social, economic, environmental and design objectives with an approximate 20-year time horizon. Secondly, it is a statement of broad policies to facilitate the attainment of objectives stated on the Plan. Objectives and policies which were determined to be relevant to the proposed project are discussed below.

10.4.1 General Plan Objectives and Policies

Natural Environment

Objective (A): To protect and preserve the natural environment of Oahu.

Policies:

(1) Protect Oahu's natural environment, especially the shoreline, valleys and ridges from incompatible development.

(4) Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water-recharge areas, distinctive landforms and existing vegetation.

(6) Design surface drainage and flood control systems in a manner which will help preserve their natural settings.

(7) Protect the natural environment from damaging levels of air, water and noise pollution.

Comments: Planning of the Kamehame 990' Water Reservoir included careful consideration of existing flora and fauna, natural features and geology, flood hazards, drainage, and potential air quality, visual and noise impacts. No plant or animal species are expected to be adversely impacted. Visual impacts and soil erosion will primarily be minimized by appropriate landscaping. Construction activity for the reservoir facility is not expected to result in significant erosion, noise and air quality impacts. An appropriate drainage plan for managing runoff at the site will be implemented during the engineering design phase.

Objective (B) To preserve and enhance the natural monuments and scenic views of Oahu for the benefit of both residents and visitors.

Policies:

(2) Protect Oahu's scenic views, especially those seen from highly developed and heavily travelled areas.

(3) Locate roads, highways, and other pubic facilities and utilities in areas where they will least obstruct important views of the mountains and the sea.

Comments: The results of a visual impacts analysis presented in Section 7.6 determined that visual impacts from the Kamehame 990' Water Reservoir Project are expected to be minimal. The reservoir is relatively small, and distant from highways and stationary scenic sites. It will also be appropriately landscaped and painted to allow it to blend in with the natural characteristics of the ridgeline.

Transportation and Utilities

Objective (B) To meet the needs of the people of Oahu for an adequate supply of water and for environmentally sound systems of waste management.

Policies: (1) Develop and maintain an adequate supply of water for both residents and visitors.

Comments: A Kamehame Ridge Water Master Plan to ensure adequate water service to existing and planned future subdivisions on Kamehame Ridge was approved by the Board of Water Supply. The reservoir will provide the required fire flows and a reliable supply of potable water for future residents of the Kamehame Ridge Unit III subdivision.

10.5 DEVELOPMENT PLAN OF THE CITY & COUNTY OF HONOLULU

The purpose of the Development Plan (DP) is to provide a means of establishing the desired sequence, patterns and characteristics of future development in the City and County of Honolulu, and provide guidance for private development decisions. To achieve this purpose, the Development Plan implements the objectives and policies of the General Plan which relate to the priority or sequence of development, and public facility needs that must be met in the future.

Based upon the Development Plan, sections from Article 4, East Honolulu, which were determined to be relevant to the proposed project are discussed below.

10.5.1 Development Plan Special Provisions for East Honolulu

Section 32-4.1. Area Description

"The General Plan population distribution guidelines for East Honolulu provide for a population range of 6.2% to 6.8% of the island wide total."

"The overall pattern of development within East Honolulu is to continue to be linear, running parallel with the shoreline and bounded by the mountainous conservation lands and the sea. Suburban residential development is to remain on the lower ridges, inner valley floors, and along Kalanianaole Highway. Some low- and medium-density apartment uses will be permitted in Hawaii Kai, as designated on the land use map."

Comments: The water reservoir project will support the planned Kamehame Ridge Unit III subdivision development resulting in an increase to the area's population by approximately 112 residents. The increase should not exceed the population distribution guidelines for East Honolulu. The resident population for East Honolulu was 5.6 percent (47,250) of Oahu's resident population in 1988.[19] In addition, the Unit III subdivision will be consistent with the desired pattern of development within East Honolulu based upon the DP Land Use Map because the subdivision site is currently designated Residential.

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19 Department of Business, Economic Development & Tourism, The State of Hawaii Data Book 1990

10.5.2 Development Plan Maps for East Honolulu

Section 32-4.4. Land Use and Public Facilities Maps

Development Plan Public Facilities Map

"The Development Plan Public Facilities Map, together with the Land Use Map, identifies a system of parks, public thoroughfares, highways and street, and the location, relocation and improvement of major public buildings, public or private facilities for utilities, terminals and drainage. On the Public Facilities Map, system elements to be provided by private developers are distinguished from those to be provided by governments or public utilities."

Comments: The proposed water reservoir project will be a privately funded project, and is considered a "major" project under DGP's Criteria for Development Plan Public Facilities Map. As a result, a DP Public Facilities Map Amendment will be required.

SECTION 11.0
FINDINGS AND REASONS SUPPORTING DETERMINATION

11.1 DETERMINATION

Potential impacts resulting from the proposed Kamehame 990' Water Reservoir Project has been evaluated in accordance with the significance criteria discussed in Section 11-200-12, Environmental Impact Statement Rules, Department of Health, State of Hawaii.

Based upon the results of field surveys, analyses of potential impacts and specialty studies performed, the proposed project will not have a significant effect on the existing environment. Therefore, a Negative Declaration is warranted for this project.

11.2 FINDINGS AND REASONS SUPPORTING DETERMINATION

The findings and reasons supporting a Negative Declaration determination for the proposed Kamehame Ridge 990' Water Reservoir Project are based upon an evaluation of the sum of effects on the quality of the environment which included the overall and cumulative effects of the project. The eleven criteria used in determining the significant effect of the project on the environment are discussed below.

1. Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.

The studies conducted have concluded that the reservoir project will not have significant long-term impacts resulting in the destruction or irrevocable commitment to loss of natural or cultural resources on Kamehame Ridge. The project site should not be considered a significant cultural or natural resource of the State since it: 1) is not a primary watershed or recharge area due to the historically low annual rainfall, 2) does not have historic or cultural sites, 3) does not have endangered plants or wildlife, 4) does not have natural streams or water bodies, and 5) is not particularly sensitive to reductions in water and air quality.

2. Curtails the range of beneficial uses of the environment.

The range of existing beneficial uses within the project site are already limited due to the slope and soils of Kamehame Ridge. As a result, the proposed project will not curtail any existing or future beneficial uses of the environment around the project site.

3. Conflicts with the State's long-term environmental policies or goals as expressed in Chapter 344, Hawaii Revised Statutes, and any revisions thereof and amendments thereto, court decisions or executive orders.

The proposed Kamehame 990' Water Reservoir Project does not conflict with the State's long-term environmental policies or goals as expressed in Chapter 344 of the Hawaii Revised Statutes.

4. Substantially affects the economic or social welfare of the community or State.

The proposed project will not substantially affect the economic or social welfare of the surrounding community or State.

5. Substantially affects public health.

The proposed water reservoir project will have a positive impact on public health by providing a reliable source of water for fire protection and domestic uses for future residents of the proposed Kamehame Ridge Unit III subdivision.

6. Involves substantial secondary impacts, such as population changes or effects on public facilities.

The proposed project will support the planned Kamehame Ridge Unit III subdivision of approximately 33 house lots. The small size of the subdivision will not result in substantial secondary impacts to existing public facilities.

7. Involves a substantial degradation of environmental quality.

Based upon the field studies undertaken in this environmental assessment, the proposed project will not involve a substantial degradation of environmental quality. Minor impacts during construction activities, such as increased noise levels and dust, are expected to occur. However, these impacts will only be temporary.

8. Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.

The proposed reservoir project will support the planned Kamehame Ridge Unit III subdivision, however, significant cumulative impacts to the existing environment are not expected based upon the results of studies conducted in this report.

9. Substantially affects a rare, threatened or endangered species, or its habitat.

The results of the field surveys conducted for this environmental assessment determined that the proposed Kamehame Ridge 990' water reservoir will not affect any rare, threatened or endangered species.

10. Detrimentally affects air or water quality, or ambient noise levels.

The proposed water reservoir project will not result in significant long-term impacts to existing air quality, water quality, or ambient noise levels. Short-term impacts to ambient noise and air quality are expected as a result of reservoir construction activities, however, these impacts are expected to be minor and temporary.

11. Affects an environmentally sensitive area such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.

The proposed project is not located in, and will not negatively affect any environmentally sensitive areas described above.

SECTION 12.0
CONSULTED PARTIES AND THOSE WHO PARTICIPATED IN THE PREPARATION OF THE REPORT

12.1 CONSULTED PARTIES

The following organizations, government agencies, and elected officials were consulted during the preparation of this environmental assessment study. These agencies were sent a project summary describing the proposed Kamehame 990' Water Reservoir Project. The issues and concerns raised in the response letters have been considered and assessed in this report. Those organizations, agencies, and officials that responded are indicated with a "•." Correspondence letters with these organizations, agencies, and officials are presented in Appendix A.

Federal Agencies

- Department of the Army, U.S. Army Engineer District, Honolulu
  U. S. Department of Agriculture - Soil Conservation Service
  U. S. Department of the Interior - Fish and Wildlife Service
  U. S. Department of the Interior - Geological Survey, Water Resources Division

State and City Representatives

- Honorable John Henry Felix, City Council
  Honorable Donna Ikeda, Senate
  Honorable David Stegmaier, House of Representatives
  Honorable Jackie Young, House of Representatives

State Agencies

- Department of Business, Economic Development, and Tourism
- Department of Land and Natural Resources
- Office of Environmental Quality Control
- Office of State Planning
  Public Utilities Commission
- State Department of Education
- State Department of Health
- State Department of Transportation
- State Land Use Commission
  University of Hawaii Environmental Center

City and County of Honolulu Agencies

- Department of General Planning
- Department of Land Utilization
- Department of Parks and Recreation
- Department of Public Works
- Department of Transportation Services
- Honolulu Fire Department
- Honolulu Police Department

Neighborhood Boards

- Hawaii Kai Neighborhood Board #1
  Waimanalo Neighborhood Board #32

Public Utilities

- Board of Water Supply
- GTE Hawaiian Tel
- Hawaiian Electric Company, Inc.

12.2 ORGANIZATIONS AND INDIVIDUALS WHO ASSISTED IN PREPARING THE EA REPORT

Pacific Planning & Engineering, Inc.

Jonathan K. Shimada, PhD.	Principal
Alvin K. U. Chong	Project Manager
Ronald A. Sato	Planner
Alyssa Miller	Planner

Subconsultants

Historical / Archaeological	Cultural Surveys Hawaii
Flora	Char & Associates

SECTION 13.0
REFERENCES CONSULTED

Chu, Michael S. and Jones, Robert B. Coastal View Study, prepared for City and County of Honolulu, Department of Land Utilization, 1987.

Cox, Doak C. Earthquakes Felt on Oahu, Hawaii and Their Intensities. Environmental Center, University of Hawaii, 1986.

Department of Geography, University of Hawaii. Atlas of Hawaii, Second Edition. University of Hawaii Press, 1983.

Department of Water, County of Kauai; Board of Water Supply, City and County of Honolulu; Department of Water Supply, County of Maui; and Department of Water Supply, County of Hawaii, Water System Standards, State of Hawaii, 1985.

Environmental Protection & Health Services Division, State Department of Health. Hawaii Air Quality Data For Period of January 1985 - December 1987, 1988.

"Isles' older volcanoes may wake." The Honolulu Advertiser, Tuesday, June 11, 1991, Section A-1, 4.

Geolabs-Hawaii. Updated Geotechnical Engineering Evaluation - Proposed Kamehame Ridge Subdivision Units II & III, November 1988.

Murabayashi, Edwin T. and Iwao Kuwahara. Oahu Lands Classified by Physical Qualities For Urban Usage. Land Study Bureau, University of Hawaii, June 1969.

Office of Business Services, Department of Education. Enrollment Projections of the Public Schools in Hawaii, 1991-1996, May 1991.

Research and Economic Analysis Division, Department of Business, Economic Development and Tourism. State of Hawaii Data Book, November 1990.

Sahara, Tamotsu, Edwin T. Murabayashi, Arthur Y. Ching, Gary D DeVight, Faith N. Fujimura, Eunice L. Awai, Lois S. Nishimoto, Harold L. Baker. Detailed Land Classification - Island of Oahu, Land Study Bureau, University of Hawaii. December 1972.

Takasaki, K.J., and Mink, J.F., Water Resources of Southeastern Oahu, U.S. Geological Survey Water Resource Investigations, 82-628, 1982.

United States Army Corps of Engineers, Pacific Ocean Division. Hurricane Vulnerability Study For Honolulu, Hawaii and Vicinity, Volumes 1 and 3. Prepared for State of Hawaii Department of Defense, 1985.

United States Department of Agriculture Soil Conservation Service. Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii, August 1972.

APPENDICES

APPENDIX A

Comments Received From Organizations and Agencies

701

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 621
HONOLULU, HAWAII 96809

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
KEITH W. AHUE
MANABU TAGOMORI
Dan T. Kochi
AGRICULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION PROGRAM
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

REP:OCEA:JN

JUL 1991

File No.: 91-446
Doc. No.: 0832E

Mr. Jonathan K. Shimada
Pacific Planning and Engineering, Inc.
1221 Kapiolani Blvd., Suite 740
Honolulu, Hawaii 96814

Dear Mr. Shimada:

Subject: Project Summaries for 1) Na Pali Haweo Transmission Line Relocation, and 2) Kamehame Unit III Water Reservoir Project Haunalua, Oahu TMK: 3-9-10: 1

Thank you for giving our Department the opportunity to comment on this matter. We have reviewed the materials you submitted and have the following comments.

Our Department's Historic Preservation Division comments that a review of our records shows that there are no known historic sites at the project parcel. The project parcel has not been inventoried, so it is possible that historic sites are present. However, inventory surveys on neighboring parcels failed to yield evidence for historic sites so we believe that the proposed projects will have "no effect" on historic sites.

It is possible that historic sites, including human burials, will be discovered during routine construction activities. The most likely location for burials and other historic sites is in the caves that are found on the sides of the ridge. Should historic sites be found, all work in the vicinity should stop and the Historic Preservation Office be contacted.

The Division of Water Resource Management indicates that the potential hazards from boulders, debris, and storm runoff to downslope valley developments should be addressed for the Kamehame unit III water reservoir project.

Thank you for your cooperation in this matter. Please feel free to call me or Roy Schaefer at our Office of Conservation and Environmental Affairs, at 548-7837, if you have questions.

Very truly yours,

William W. Paty

DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM

JOHN WAIHEE
GOVERNOR
MURRAY E. TOWILL
DIRECTOR
BARBARA KIM STANTON
DEPUTY DIRECTOR
RICK EGGED
DEPUTY DIRECTOR

ENERGY DIVISION, 335 MERCHANT ST., RM. 110, HONOLULU, HAWAII 96813 PHONE: (808) 548-4160 FAX: (808) 521-3243

91:1761A-239

May 3, 1991

Dr. Jonathan K. Shimada
Pacific Planning and Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Dr. Shimada:

This is in response to your letter dated April 18, 1991, regarding the preparation of Environmental Assessment Reports for the Na Pali Haweo Transmission Line Relocation and the Kamehame Unit III Water Reservoir project in the Hawaii Kai area.

We have reviewed your plans for these projects, and have no comments regarding them.

Sincerely,

Murray E. Towill

Murray E. Towill

MET/TOB:dt

PACIFIC PLANNING
& ENGINEERING, INC

June 3, 1991

Mr. Murray E. Towill, Director
Department of Business, Economic Development and Tourism
State of Hawaii
335 Merchant Street, Room 110
Honolulu, Hawaii, 96813

Dear Mr. Towill:

Subject: Environmental Asssessment for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects

Thank you very much for your May 3 letter regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation projects.

We appreciate your prompt reply. If you have any questions regarding the proposed projects please contact Mr. Alvin Chong at 521-9195.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

GTE Hawaiian Tel
Beyond the call

GTE Hawaiian Telephone Company Incorporated
PO Box 2200 · Honolulu, HI 96841 · (808) 546-4511

May 16, 1991

Jonathan K. Shimada, PhD, PE
Principal
Pacific Planning and Engineering, Inc.
1221 Kapiolani Blvd. Suite 740
Honolulu, HI 96814

Dear Mr. Shimada:

Re: Environmental Assessment for:
Na Pali Haweo Transmission Line Relocation
Kamehame Unit III Water Reservoir

We have reviewed the project summaries for both the transmission line relocation and water reservoir projects and have no comments to offer.

Thank you for the opportunity to review and comment on these projects.

Sincerely,

Walter M. Matsumoto
Operations Manager -
Outside Plant Engineering

PACIFIC PLANNING
ENGINEERING, INC

June 3, 1991

Mr. Walter M. Matsumoto, Operations Manager
Outside Plant Engineering
GTE Hawaiian Telephone Company, Inc.
P.O. Box 2200,
Honolulu, Hawaii 96841

Dear Mr. Matsumoto:

Subject: Environmental Asssessment for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects

Thank you very much for your May 16 letter regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation projects.

We appreciate your prompt reply. If you have any questions regarding the proposed projects please contact Mr. Alvin Chong at 521-9195.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843

May 13, 1991

Mr. Jonathan K. Shimada
Pacific Planning & Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Mr. Shimada:

Subject: Your Letter of April 18, 1991 Regarding the Environmental Assessment for the Proposed Na Pali Haweo Electric Transmission Line Relocation and the Kamehame Unit III Water Reservoir Projects, TMK: 3-9-10: 1

Thank you for the opportunity to review and comment on the proposed projects in conjunction with the Kamehame Unit III development. We have the following comments on the environmental assessments:

1. Kamehame Unit III Water Reservoir

   The proposed 0.1 million gallon "990" Kamehame Reservoir and transmission mains conform to the water master plan. The construction drawings should be submitted for our review and approval.

2. Na Pali Haweo Electric Transmission Line Relocation

   We have no objections to the proposed project. The relocation of the electric transmission line will not impact our water facilities.

If you have any questions, please contact Bert Kuioka at 527-5235.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

PACIFIC PLANNING
& ENGINEERING, INC

June 4, 1991

Mr. Kazu Hayashida, Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Hayashida:

Subject: Environmental Assessments for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects

Thank you very much for your comments dated May 13 regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects.

All of the concerns raised in your letter will be given due consideration as we prepare the Kamehame Ridge Utilities Environmental Assessments.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001

William A. Bonnet
Manager
Environmental Department

November 12, 1991

Ms. Elisa Miller
Pacific Planning & Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, HI 96814

Dear Ms. Miller:

Subject: Response to Environmental Assessment Report for Kamehame Unit III Water Reservoir

We have reviewed the subject EIS, and have no comments at this time on the proposed project in the subject area. HECO shall reserve further comments pertaining to the protection of existing powerlines bordering and servicing the area until construction plans are finalized.

Sincerely,

RECEIVED
NOV 14 1991

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001

August 14, 1991

William A. Bonnet
Manager
Environmental Department

Mr. Jonathan K. Shimada
Pacific Planning & Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Mr. Shimada:

Re: Kamehame 46 KV Relocation
Environmental Assessment Report
HECO Project Number P9238

This letter is to inform you of HECO's position on the subject Environmental Assessment Report:

1. The spacing between the existing 46 KV line and the proposed 46 KV line was increased from approximately ten (10) feet to approximately sixty (60) feet to meet the G.O. 6 requirement for conflicting lines. Therefore, the new alignment is acceptable.

2. The revised cost of the project requires HECO to file an application with the Public Utility Commission (PUC) for capital expenditures. The PUC will decide on HECO's application ninety (90) days after it is filed and issue a Decision and Order (D & O). At that time HECO will know if the application is approved.

While the decision to approve this project rests with the PUC, we feel this alternative is the most cost effective one, and meets HECO's design and planning criteria.

Please call Roy Hiyama at 543-7925 or Alvin Ching at 543-7028 if your have any questions.

Very truly yours,

William A. Bonnet
Manager
Environmental Department

WAB:0618w

cc: Barry Heyers
R. H. Sekiya
S. Elliot
R. Hiyama/A. Ching

An HEI Company

PACIFIC PLANNING
& ENGINEERING, INC

August 14, 1991

Mr. William A. Bonnet, Environmental Manager
Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, Hawaii 96840-0001

Dear Mr. Bonnet:

Subject: Environmental Assessment for Na Pali Haweo Transmission Line Relocation

Thank you very much for your August 14, 1991 letter regarding the proposed Na Pali Haweo Transmission Line Relocation project.

We appreciate your timely response. If you have any questions regarding the proposed project please contact Mr. Alvin Chong at 521-9195.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

JOHN WAIHEE
Governor

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
220 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96813

BRIAN J. J. CHOY
Director

RECEIVED
MAY 21 1991

May 16, 1991

Dr. Jonathan K. Shimada
Pacific Planning & Engineering, Inc.
1221 Kapiolani Boulevard
Suite 740
Honolulu, Hawaii 96814

Dear Dr. Shimada:

Thank you for providing the opportunity to review and comment on the environmental assessment reports for 1) Na Pali Haweo transmission line relocation, and 2) Kamehame Unit III water reservoir projects. We do not have any comments to offer on the reports at this time.

Sincerely,

BRIAN J.J. CHOY
Director, OEQC

PACIFIC PLANNING
& ENGINEERING, INC

June 3, 1991

Mr. Brian J.J. Choy, Director
Office of Environmental Quality Control
State of Hawaii
220 South King Street
Honolulu, Hawaii 96813

Dear Mr. Choy:

Subject: Environmental Asssessment for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects

Thank you very much for your May 16 letter regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation projects.

We appreciate your prompt reply. If you have any questions regarding the proposed projects please contact Mr. Alvin Chong at 521-9195.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

JOHN WAIHEE
GOVERNOR

CHARLES T. TOGUCHI
SUPERINTENDENT

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

RECEIVED
MAY 1 - 1991

May 6, 1991

Dr. Jonathan K. Shimada, PhD, PE
Principal
Pacific Planning and Engineering
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Mr. Shimada:

SUBJECT: Na Pali Haweo Transmission Line Relocation and Kamehame III Water Reservoir Projects

Our review of the subject proposed projects indicates that it will have no impact on the public schools in the area.

Thank you for the opportunity to comment.

Sincerely,

Charles T. Toguchi

Charles T. Toguchi
Superintendent

CTT:jl

cc: T. Nakai
J. Kim

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

PACIFIC PLANNING
& ENGINEERING, INC

June 3, 1991

Mr. Charles T. Toguchi, Superintendent
Department of Education
State of Hawaii
P.O. Box 2360
Honolulu, Hawaii 96804

Dear Superintendent Toguchi:

Subject: Environmental Asssessment for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects

Thank you very much for your May 6 letter regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation projects.

We appreciate your prompt reply. If you have any questions regarding the proposed projects please contact Mr. Alvin Chong at 521-9195.

Sincerely,

Jonathan K. Shimada

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

JOHN WAIHEE
GOVERNOR OF HAWAII

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

In reply, please refer to:
HEER OFFICE
91-2-133H-LAU

June 5, 1991

Mr. Jonathan K. Shimada, Ph.D.
Pacific Planning and Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Dr. Shimada:

Subject: Comments on Project Summary of the Na Pali Haweo Transmission Line Relocation

The information submitted by Bedford Properties, Inc., concerning the relocation of one of the Na Pali Haweo 46-kilovolt (kV) electric transmission lines by the Hawaiian Electric Company, is insufficient for the purpose of evaluating possible public-health risks. It is impossible to tell, when studying the diagrams in the project summary, how far the site of future homes is from the present power lines and from the future relocated power lines.

It is suspected, but still unproven, that there may be harmful health effects from exposure to electromagnetic fields from electric power lines. If there were a health risk, then the idea of moving an existing 46-kV power line away from a proposed housing subdivision would be a commendable step, though the developer is moving the power line for aesthetic rather than health reasons.

If you have further questions, or if you have more details and distances to report in order to obtain a more thorough review, please contact Mr. Leslie Au, Office of Hazard Evaluation and Emergency Response, at 543-8249.

Very truly yours,

JOHN C. LEWIN, M.D.
Director of Health

PACIFIC PLANNING
& ENGINEERING, INC

July 10, 1991

Dr. John C. Lewin, Director
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Dr. Lewin:

Subject: Environmental Assessment for Na Pali Haweo Transmission Line Relocation, and Kamehame Unit III Water Reservoir Projects

Thank you very much for your June 5, 1991 letter regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation projects.

Your comments will be considered in preparing the Environmental Assessment Report, and we will be assessing potential health effects associated with exposure to electromagnetic fields in the report.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:
MEB OFFICE
91-2-133E-LAu

June 5, 1991

Mr. Jonathan K. Shimada, Ph.D.
Pacific Planning and Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Dr. Shimada:

Subject: Comments on Project Summary of the Na Pali Haweo Transmission Line Relocation

The information submitted by Bedford Properties, Inc., concerning the relocation of one of the Na Pali Haweo 46-kilovolt (kV) electric transmission lines by the Hawaiian Electric Company, is insufficient for the purpose of evaluating possible public-health risks. It is impossible to tell, when studying the diagrams in the project summary, how far the site of future homes is from the present power lines and from the future relocated power lines.

It is suspected, but still unproven, that there may be harmful health effects from exposure to electromagnetic fields from electric power lines. If there were a health risk, then the idea of moving an existing 46-kV power line away from a proposed housing subdivision would be a commendable step, though the developer is moving the power line for aesthetic rather than health reasons.

If you have further questions, or if you have more details and distances to report in order to obtain a more thorough review, please contact Mr. Leslie Au, Office of Hazard Evaluation and Emergency Response, at 543-8249.

Very truly yours,

JOHN C. LEWIN, M.D.
Director of Health

PACIFIC PLANNING
& ENGINEERING, INC

July 10, 1991

Dr. John C. Lewin, Director
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Dr. Lewin:

Subject: Environmental Assessment for Na Pali Haweo Transmission Line Relocation, and Kamehame Unit III Water Reservoir Projects

Thank you very much for your June 5, 1991 letter regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation projects.

Your comments will be considered in preparing the Environmental Assessment Report, and we will be assessing potential health effects associated with exposure to electromagnetic fields in the report.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858-5440

REPLY TO ATTENTION OF:

May 17, 1991

Planning Division

Dr. Jonathan K. Shimada
Principal
Pacific Planning & Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Dr. Shimada:

Thank you for the opportunity to review the project summaries for two projects in East Oahu: (1) Na Pali Haweo Transmission Line Relocation; and (2) Kamehame Unit II Water Reservoir. The following comments are offered:

a. Neither project requires a Department of the Army permit.

b. According to the Federal Emergency Management Agency's Flood Insurance Rate Map, Panel 150001-0125-B, dated September 4, 1987 (copy of relevant portion enclosed), the project sites are located in Zone D (areas in which flood hazards are undetermined).

Sincerely,

Kisuk Cheung
Director of Engineering

Enclosure

RECEIVED
MAY 1 8 1991

PACIFIC PLANNING
& ENGINEERING, INC

June 4, 1991

Mr. Kisuk Cheung, Director of Engineering
Department of The Army
United States Army Engineer District
Fort Shafter, Building 230
Fort Shafter, Hawaii, 96858

Dear Mr. Cheung:

Subject: Environmental Assessments for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects

Thank you very much for your comments dated May 17 regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects.

Your comments confirming that 1) the subject property lies in Zone D of the Federal Emergency Management Agency's Flood Insurance Map, and that 2) neither project requires a Department of the Army permit are greatly appreciated.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9193 ▲ FAX (808) 536-9748

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
Room 104, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813
Telephone: 548-3011

RECEIVED
APR 29 1991

April 25, 1991

Mr. Jonathan K. Shimada
Pacific Planning & Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Mr. Shimada:

Subject: Environmental Assessments for the 1) Na Pali Haweo Transmission LIne Relocation, 2) Kamehame Unit III Water Reservoir Project

We have reviewed the information provided for the subject projects transmitted in your letter dated April 18, 1991, and find that the Transmission Line Relocation area is located in the State Land Use Conservation District at various points of the alignment. The Kamehame Reservoir site is located entirely within the State Land Use Conservation District.

If more detailed land use designations are needed for the transmission line alignment, we request that more detailed maps, drawn to scale, be provided.

Thank you for the opportunity to comment on this matter. If you have any questions, please call me or my staff at 548-8101.

Sincerely,

ESTHER UEDA
Executive Officer

EU:to

PACIFIC PLANNING
& ENGINEERING, INC

June 3, 1991

Ms. Esther Ueda, Executive Officer
Land Use Comission
Department of Business, Economic Development & Tourism
State of Hawaii
335 Merchant Street
Honolulu, Hawaii 96813

Dear Ms. Ueda:

Subject: Environmental Assessments for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects

Thank you very much for your comments dated April 25 regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects.

We appreciate your verifying that portions of the subject property are located in the State Land Use Conservation District.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

OFFICE OF STATE PLANNING
Office of the Governor
STATE CAPITOL, HONOLULU, HAWAII 96813 TELEPHONE [redacted]

June 3, 1991

Dr. Jonathan K. Shimada, Principal
Pacific Planning and Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Mr. Shimada:

Subject: Comments on the Proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects
Kamehame Ridge, Hawaii Kai, Oahu

Pacific Planning and Engineering, Inc. has been engaged by Bedford Properties, Inc. to prepare environmental assessment reports for two proposed projects: 1) Kamehame Unit III Water Reservoir and 2) Na Pali Haweo Transmission Line Relocation. It is our understanding that the proposed 0.1 MG reinforced concrete water reservoir project will serve the proposed Kamehame Ridge Unit III subdivision which will consist of 33 residential units. The proposed 46 kV transmission line relocation project will be located along the Ewa slopes of Kamehame Ridge. Appproximately 15 poles will be installed ranging in height from 50 to 60 feet. The project sites are both located on a portion of Tax Map Key: 3-9-10: 1.

Due to the scenic values in the region, we have concerns regarding the visual impact of the proposed projects from surrounding lands, especially from the [illegible]kapuu Head, Kalama Valley, Puu O Kipahulu, Sandy Beach, Queen's [illegible]r areas. The EIS should assess these impacts. It may be [illegible]rtake a visual simulation analysis of the project.

[illegible] for the opportunity to comment. Should you have any questions, please contact the Land Use Division at 548-2066.

Sincerely,

Harold S. Masumoto
Director

PACIFIC PLANNING
& ENGINEERING, INC

July 10, 1991

Mr. Harold S. Masumoto, Director
Office of State Planning
Office of the Govenor
State Capital
Honolulu, Hawaii 96813

Dear Mr. Masumoto:

Subject: Environmental Assessment for Na Pali Haweo Transmission Line Relocation, and Kamehame Unit III Water Reservoir Projects

Thank you very much for your June 3, 1991 letter regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation projects.

Your comments will be considered in preparing the Environmental Assessment Report, and we will be assessing potential visual impacts which may be associated with the subject projects.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE [808] 521-9193 ▲ FAX [808] 526-9748

OFFICE OF STATE PLANNING
Office of the Governor
STATE CAPITOL, HONOLULU, HAWAII 96813 TELEPHONE (808) 548-3982

June 3, 1991

Dr. Jonathan K. Shimada, Principal
Pacific Planning and Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Mr. Shimada:

Subject: Comments on the Proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects
Kamehame Ridge, Hawaii Kai, Oahu

Pacific Planning and Engineering, Inc. has been engaged by Bedford Properties, Inc. to prepare environmental assessment reports for two proposed projects: 1) Kamehame Unit III Water Reservoir and 2) Na Pali Haweo Transmission Line Relocation. It is our understanding that the proposed 0.1 MG reinforced concrete water reservoir project will serve the proposed Kamehame Ridge Unit III subdivision which will consist of 33 residential units. The proposed 46 kV transmission line relocation project will be located along the Ewa slopes of Kamehame Ridge. Appproximately 15 poles will be installed ranging in height from 50 to 60 feet. The project sites are both located on a portion of Tax Map Key: 3-9-10: 1.

Due to the scenic values in the region, we have concerns regarding the visual impact of the proposed projects from surrounding lands, especially from the highway, Makapuu Head, Kalama Valley, Puu O Kipahulu, Sandy Beach, Queen's Beach, and other areas. The EIS should assess these impacts. It may be helpful to undertake a visual simulation analysis of the project.

Thank you for the opportunity to comment. Should you have any questions, please contact the Land Use Division at 548-2066.

Sincerely,

Harold S. Masumoto
Director

PACIFIC PLANNING
& ENGINEERING, INC

July 10, 1991

Mr. Harold S. Masumoto, Director
Office of State Planning
Office of the Govenor
State Capital
Honolulu, Hawaii 96813

Dear Mr. Masumoto:

Subject: Environmental Assessment for Na Pali Haweo Transmission Line Relocation, and Kamehame Unit III Water Reservoir Projects

Thank you very much for your June 3, 1991 letter regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation projects.

Your comments will be considered in preparing the Environmental Assessment Report, and we will be assessing potential visual impacts which may be associated with the subject projects.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

PACIFIC PLANNING
& ENGINEERING, INC

June 3, 1991

Mr. Benjamin B. Lee, Chief Planning Officer
Department of General Planning
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Lee:

Subject: Environmental Assessments for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects

Thank you very much for your comments dated May 23 regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects.

All of the concerns raised in your letter will be given due consideration as we prepare the Kamehame Ridge Utilities Environmental Assessments.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 720 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

JOHN WAIHEE
GOVERNOR OF HAWAII

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

In reply, please refer to:
MEER OFFICE
91-2-133X-LAU

June 5, 1991

Report

Mr. Jonathan K. Shimada, Ph.D.
Pacific Planning and Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Dr. Shimada:

Subject: Comments on Project Summary of the Na Pali Haweo Transmission Line Relocation

The information submitted by Bedford Properties, Inc., concerning the relocation of one of the Na Pali Haweo 46-kilovolt (kV) electric transmission lines by the Hawaiian Electric Company, is insufficient for the purpose of evaluating possible public-health risks. It is impossible to tell, when studying the diagrams in the project summary, how far the site of future homes is from the present power lines and from the future relocated power lines.

It is suspected, but still unproven, that there may be harmful health effects from exposure to electromagnetic fields from electric power lines. If there were a health risk, then the idea of moving an existing 46-kV power line away from a proposed housing subdivision would be a commendable step, though the developer is moving the power line for aesthetic rather than health reasons.

If you have further questions, or if you have more details and distances to report in order to obtain a more thorough review, please contact Mr. Leslie Au, Office of Hazard Evaluation and Emergency Response, at 543-8249.

Very truly yours,

JOHN C. LEWIN, M.D.
Director of Health

PACIFIC PLANNING
& ENGINEERING, INC

July 10, 1991

Dr. John C. Lewin, Director
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Dr. Lewin:

Subject: Environmental Assessment for Na Pali Haweo Transmission Line Relocation, and Kamehame Unit III Water Reservoir Projects

Thank you very much for your June 5, 1991 letter regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation projects.

Your comments will be considered in preparing the Environmental Assessment Report, and we will be assessing potential health effects associated with exposure to electromagnetic fields in the report.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9193 ▲ FAX (808) 526-9748

DEPARTMENT OF PARKS AND RECREATION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

RECEIVED

May 2, 1991

Mr. Jonathan K. Shimada
Pacific Planning & Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Mr. Shimada:

We have reviewed the Na Pali Haweo Transmission Line Relocation and Kamehame Unit III Water Reservoir projects and have no comment to offer.

Should you have any questions, please contact Lester Lai of our Advance Planning Branch at 523-4696.

Sincerely,

WALTER M. OZAWA, Director

WHO:ei

PACIFIC PLANNING
ENGINEERING, INC

June 3, 1991

Mr. Walter M. Ozawa
Department of Parks and Recreation
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Ozawa:

Subject: <u>Environmental Asssessment for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects</u>

Thank you very much for your May 2 letter regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation projects.

We appreciate your prompt reply. If you have any questions regarding the proposed projects please contact Mr. Alvin Chong at 521-9195.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
Room 104, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813
Telephone: 548-3011

RECEIVED
APR 29 1991

April 25, 1991

Mr. Jonathan K. Shimada
Pacific Planning & Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Mr. Shimada:

Subject: Environmental Assessments for the 1) Na Pali Haweo Transmission LIne Relocation, 2) Kamehame Unit III Water Reservoir Project

We have reviewed the information provided for the subject projects transmitted in your letter dated April 18, 1991, and find that the Transmission Line Relocation area is located in the State Land Use Conservation District at various points of the alignment. The Kamehame Reservoir site is located entirely within the State Land Use Conservation District.

If more detailed land use designations are needed for the transmission line alignment, we request that more detailed maps, drawn to scale, be provided.

Thank you for the opportunity to comment on this matter. If you have any questions, please call me or my staff at 548-8101.

Sincerely,

ESTHER UEDA
Executive Officer

EU:to

PACIFIC PLANNING
& ENGINEERING, INC

June 3, 1991

Ms. Esther Ueda, Executive Officer
Land Use Comission
Department of Business, Economic Development & Tourism
State of Hawaii
335 Merchant Street
Honolulu, Hawaii 96813

Dear Ms. Ueda:

Subject: Environmental Assessments for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects

Thank you very much for your comments dated April 25 regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects.

We appreciate your verifying that portions of the subject property are located in the State Land Use Conservation District.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9185 ▲ FAX (808) 526-9748

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

JOSEPH M. MAGALDI, JR.
DIRECTOR

AMAR SAPPAL
DEPUTY DIRECTOR

TE-2222
PL91.1.141

May 13, 1991

Jonathan K. Shimada, PhD, PE
Pacific Planning and Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Dr. Shimada:

Subject: Na Pali Haweo Transmission Line Relocation
and Kamehame Unit III Water Reservoir Projects,
Hawaii Kai
Environmental Assessment
Tax Map Key: 3-9-10: 1

This is in response to your letter of April 18, 1991 requesting our review of the subject project.

We have no comments to offer at this time.

Should you have any questions, please contact Wayne Nakamoto of my staff at 523-4190.

Sincerely,

JOSEPH M. MAGALDI, JR.
Director

PACIFIC PLANNING
& ENGINEERING, INC

June 3, 1991

Mr. Joseph M. Magaldi, Director
Department of Transportation Services
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Magaldi:

Subject: Environmental Asssessment for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects

Thank you very much for your May 13 letter regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation projects.

We appreciate your prompt reply. If you have any questions regarding the proposed projects please contact Mr. Alvin Chong at 521-9195.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

PACIFIC PLANNING
& ENGINEERING, INC

June 3, 1991

Mr. Benjamin B. Lee, Chief Planning Officer
Department of General Planning
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Lee:

Subject: Environmental Assessments for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects

Thank you very much for your comments dated May 23 regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects.

All of the concerns raised in your letter will be given due consideration as we prepare the Kamehame Ridge Utilities Environmental Assessments.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

1455 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96814 - AREA CODE (808) 943-3111

FRANK F. FASI
MAYOR

MICHAEL S. NAKAMURA
CHIEF

HAROLD M. KAWASAKI
DEPUTY CHIEF

OUR REFERENCE ES-LK

May 3, 1991

RECEIVED

Jonathan K. Shimada, Ph.D., PE
Principal, Pacific Planning & Engineering
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Dr. Shimada:

This is in response to your request of April 18, 1991, for comments on the Na Pali Haweo Transmission Line Relocation and Kamehame Unit III Water Reservoir projects.

Neither project will have any impact on our facilities or services. Therefore, we have no comment on them.

Thank you for the opportunity to review these proposals.

Sincerely,

MICHAEL S. NAKAMURA
Chief of Police

By [signature]
CHESTER E. HUGHES
Assistant Chief of Police
Support Services Bureau

PACIFIC PLANNING
ENGINEERING, INC

June 3, 1991

Mr. Michael S. Nakamura, Chief
Police Department
City and County of Honolulu
1455 South Beretania Street
Honolulu, Hawaii 96814

Dear Chief Nakamura:

Subject: Environmental Asssessment for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects

Thank you very much for your May 3 letter regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation projects.

We appreciate your prompt reply. If you have any questions regarding the proposed projects please contact Mr. Alvin Chong at 521-9195.

Sincerely,

[signature]
Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

WALTER M. OZAWA
DIRECTOR

ALVIN K.C. AU
DEPUTY DIRECTOR

RECEIVED
HONOLULU

May 2, 1991

Mr. Jonathan K. Shimada
Pacific Planning & Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Mr. Shimada:

We have reviewed the Na Pali Haweo Transmission Line Relocation and Kamehame Unit III Water Reservoir projects and have no comment to offer.

Should you have any questions, please contact Lester Lai of our Advance Planning Branch at 523-4696.

Sincerely,

WALTER M. OZAWA, Director

WMO:el

PACIFIC PLANNING
& ENGINEERING, INC

June 3, 1991

Mr. Walter M. Ozawa
Department of Parks and Recreation
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Ozawa:

Subject: Environmental Asssessment for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects

Thank you very much for your May 2 letter regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation projects.

We appreciate your prompt reply. If you have any questions regarding the proposed projects please contact Mr. Alvin Chong at 521-9195.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843

May 13, 1991

Mr. Jonathan K. Shimada
Pacific Planning & Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Mr. Shimada:

Subject: Your Letter of April 18, 1991 Regarding the Environmental Assessment for the Proposed Na Pali Haweo Electric Transmission Line Relocation and the Kamehame Unit III Water Reservoir Projects, TMK: 3-9-10: 1

Thank you for the opportunity to review and comment on the proposed projects in conjunction with the Kamehame Unit III development. We have the following comments on the environmental assessments:

1. Kamehame Unit III Water Reservoir

   The proposed 0.1 million gallon "990" Kamehame Reservoir and transmission mains conform to the water master plan. The construction drawings should be submitted for our review and approval.

2. Na Pali Haweo Electric Transmission Line Relocation

   We have no objections to the proposed project. The relocation of the electric transmission line will not impact our water facilities.

If you have any questions, please contact Bert Kuioka at 527-5235.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

PACIFIC PLANNING & ENGINEERING, INC

June 4, 1991

Mr. Kazu Hayashida, Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Hayashida:

Subject: Environmental Assessments for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects

Thank you very much for your comments dated May 13 regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects.

All of the concerns raised in your letter will be given due consideration as we prepare the Kamehame Ridge Utilities Environmental Assessments.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

JOSEPH M. MAGALDI, JR.
DIRECTOR

AMAR SAPPAL
DEPUTY DIRECTOR

TE-2222
PL91.1.141

May 13, 1991

Jonathan K. Shimada, PhD, PE
Pacific Planning and Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Dr. Shimada:

Subject: Na Pali Haweo Transmission Line Relocation
and Kamehame Unit III Water Reservoir Projects,
Hawaii Kai
Environmental Assessment
Tax Map Key: 3-9-10: 1

This is in response to your letter of April 18, 1991 requesting our review of the subject project.

We have no comments to offer at this time.

Should you have any questions, please contact Wayne Nakamoto of my staff at 523-4190.

Sincerely,

JOSEPH M. MAGALDI, JR.
Director

PACIFIC PLANNING
& ENGINEERING, INC

June 3, 1991

Mr. Joseph M. Magaldi, Director
Department of Transportation Services
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Magaldi:

Subject: Environmental Asssessment for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects

Thank you very much for your May 13 letter regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation projects.

We appreciate your prompt reply. If you have any questions regarding the proposed projects please contact Mr. Alvin Chong at 521-9195.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001

August 14, 1991

William A. Bonnet
Manager
Environmental Department

Mr. Jonathan K. Shimada
Pacific Planning & Engineering, Inc.
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Mr. Shimada:

Re: Kamehame 46 KV Relocation
Environmental Assessment Report
HECO Project Number P9238

This letter is to inform you of HECO's position on the subject Environmental Assessment Report:

1. The spacing between the existing 46 KV line and the proposed 46 KV line was increased from approximately ten (10) feet to approximately sixty (60) feet to meet the G.O. 6 requirement for conflicting lines. Therefore, the new alignment is acceptable.

2. The revised cost of the project requires HECO to file an application with the Public Utility Commission (PUC) for capital expenditures. The PUC will decide on HECO's application ninety (90) days after it is filed and issue a Decision and Order (D & O). At that time HECO will know if the application is approved.

While the decision to approve this project rests with the PUC, we feel this alternative is the most cost effective one, and meets HECO's design and planning criteria.

Please call Roy Hiyama at 543-7925 or Alvin Ching at 543-7028 if your have any questions.

Very truly yours,

William A. Bonnet
Manager
Environmental Department

WAB:0618w

cc: Barry Heyers
R. H. Sekiya
S. Elliot
R. Hiyama/A. Ching

PACIFIC PLANNING
& ENGINEERING, INC

August 14, 1991

Mr. William A. Bonnet, Environmental Manager
Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, Hawaii 96840-0001

Dear Mr. Bonnet:

Subject: Environmental Assessment for Na Pali Haweo Transmission Line Relocation

Thank you very much for your August 14, 1991 letter regarding the proposed Na Pali Haweo Transmission Line Relocation project.

We appreciate your timely response. If you have any questions regarding the proposed project please contact Mr. Alvin Chong at 521-9195.

Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU
1455 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96814 • AREA CODE (808) 955-3111

FRANK F. FASI
MAYOR

MICHAEL S. NAKAMURA
CHIEF

HAROLD M. KAWASAKI
DEPUTY CHIEF

OUR REFERENCE ES-LK

May 3, 1991

Jonathan K. Shimada, Ph.D., PE
Principal, Pacific Planning & Engineering
1221 Kapiolani Boulevard, Suite 740
Honolulu, Hawaii 96814

Dear Dr. Shimada:

This is in response to your request of April 18, 1991, for comments on the Na Pali Haweo Transmission Line Relocation and Kamehame Unit III Water Reservoir projects.

Neither project will have any impact on our facilities or services. Therefore, we have no comment on them.

Thank you for the opportunity to review these proposals.

Sincerely,

MICHAEL S. NAKAMURA
Chief of Police

By
CHESTER E. HUGHES
Assistant Chief of Police
Support Services Bureau

PACIFIC PLANNING
& ENGINEERING, INC

June 3, 1991

Mr. Michael S. Nakamura, Chief
Police Department
City and County of Honolulu
1455 South Beretania Street
Honolulu, Hawaii 96814

Dear Chief Nakamura:

Subject: Environmental Asssessment for Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation Projects

Thank you very much for your May 3 letter regarding the proposed Kamehame Ridge III Water Reservoir and Na Pali Haweo Transmission Line Relocation projects.

We appreciate your prompt reply. If you have any questions regarding the proposed projects please contact Mr. Alvin Chong at 521-9195.

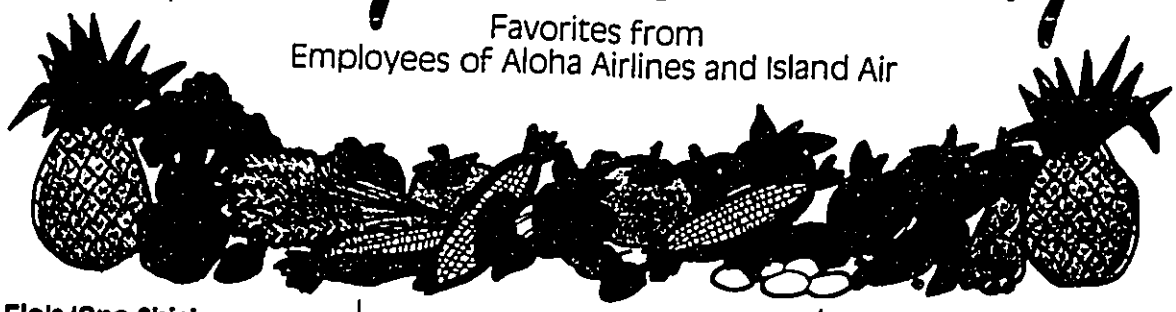
Sincerely,

Jonathan K. Shimada, PhD, PE
Principal

1221 KAPIOLANI BOULEVARD ▲ SUITE 740 ▲ HONOLULU, HAWAII 96814 ▲ TELEPHONE (808) 521-9195 ▲ FAX (808) 526-9748

Recipe Roundup

Favorites from
Employees of Aloha Airlines and Island Air



Aunty Flo's 'Ono Chicken

Harriet Lum (Secretary, Inflight Services)

4 lbs. chicken wings
1 cup shoyu (soy sauce)
1 cup sugar
1 cup ketchup
ginger, grated
garlic, minced

In a pot, mix all ingredients and pour over chicken. Boil until cooked, about 30 to 45 minutes.

Shrimp and Vegetable Tempura

Frances Oba (Airport Services—Honolulu)

Batter:
2 cups flour
1 tsp. salt
2 Tbsp. sugar
2 tsp. Ajinomoto
1 tsp. dry mustard
2 eggs
1½ cups water
½ lb. shrimp, cleaned and chopped
oil for deep frying
Vegetables: carrots, string beans, gobo (slivered) and chopped water chestnuts

Mix dry ingredients; add eggs and water; beat till well blended. Sprinkle additional salt and flour on shrimp and vegetables before mixing into batter. Drop by tablespoon into hot oil. Deep fry until done and drain on paper towels.

Billy P's Cookies

Antoinette Naone-Palmerton (Marketing Services)

1 cup butter (not margarine)
1¼ cups packed brown sugar
2 Tbsp. milk
1 Tbsp. vanilla
1 egg
1¼ cups flour
1 tsp. salt
¼ tsp. baking soda
1 cup semi-sweet chocolate chips
½ cup raisins
¼ cup oatmeal

Heat oven to 375 degrees. In a large bowl, combine butter, sugar, milk and vanilla and mix together at medium speed on electric mixer. Add egg and beat into creamy mixture. Combine flour, salt, baking soda and mix into mixture until just blended. Stir in chocolate chips, raisins and oatmeal. Drop dough by spoon on ungreased baking sheet and bake 10-12 minutes for chewy; 11-15 minutes for crispy. Makes about 4 dozen 3-inch cookies.

Pickled Onions and Peppers

Jeffrey Albao (Customer Service Agent—Kaua'i)

3 small green peppers, cut in 1½-inch squares
3 medium round onions, cut in 1-inch wedges
1 tsp. chopped red pepper
1 tsp. sugar
2 tsp. salt
½ tsp. monosodium glutamate
1 cup vinegar
½ cup water

Combine all ingredients and mix thoroughly. Pack into quart jar; cover. Let stand at room temperature 2-3 days. Refrigerate before serving.

Rack of Lamb

Mae Takahashi (Director, Inflight Services)

2 racks of lamb (7-8 ribs each)
1 tsp. Hawaiian rock salt
1 tsp. coarsely ground black pepper
4 cloves garlic, minced
1 lime

Preheat oven to 325 degrees. Squeeze lime over lamb. Let stand for 15 minutes. Season lamb with garlic, salt and pepper. Place lamb on a rack in roasting pan. Roast in preheated oven for one hour or until meat thermometer reaches 160 degrees. The lamb will be cooked medium-well.

Serve with mint jelly, mango chutney or with the following mint sauce:
¼ cup water
¼ cup chopped fresh mint leaves
½ cup Japanese rice vinegar
¼ cup *mirin* (rice wine)
1 tsp. sugar
1 Tbsp. lemon juice

Combine all ingredients in saucepan. Bring to a boil and simmer for 30 minutes.

Baked Chicken Chablis

Gail Young (Flight Attendant)

8 boneless chicken breasts
flour, salt and pepper for dusting chicken
6 Tbsp. butter
2 Tbsp. flour
¾ cup chicken broth
¾ cup Chablis or other white wine
¼ cup sliced green onions
1 4-oz. can button mushrooms
2 cups marinated artichoke hearts

Dust chicken with salt, pepper and flour. Melt 4 Tbsp. butter in shallow baking pan. Place chicken in pan and bake uncovered at 350 degrees for 20-30 minutes until almost tender. Meanwhile, melt remaining 2 Tbsp. butter in saucepan. Stir in 2 Tbsp. flour, add chicken broth and wine; stir until thickened and smooth. Remove chicken from oven and turn over. Sprinkle with green onions, mushrooms and artichoke hearts. Pour sauce over chicken and bake at 325 degrees for 20-30 minutes.

Blender Chocolate Mousse

Gail Young (Flight Attendant)

1 large egg
1 envelope (¼ oz.) unflavored gelatin
1 cup boiling water
1 tsp. instant coffee
½ cup ricotta cheese
½ cup cold skim milk
2½ Tbsp. cocoa powder
pinch of salt
¼ cup sugar
whipped cream (optional)

In a blender or food processor, combine the egg, gelatin and 1 Tbsp. of cold water. Blend until combined, about 10 seconds. Scrape mixture down and blend 10 more seconds. Let stand until the gelatin softens, about 1 minute.

Add boiling water and blend until gelatin is dissolved, about 10 seconds. Add the instant coffee, ricotta cheese, skim milk, cocoa, salt and sugar. Blend till smooth, about 1 minute.

Pour into 6 dessert dishes and chill at least 2 hours, or overnight. Garnish with whipped cream, if desired.

Favorites from Employees of
Aloha Airlines and Island Air

Recipe Roundup

DARRELL GRINDSTAFF

Hot Artichoke Dip

Gail Young (Flight Attendant)

1 16-oz. can (or jar) artichoke hearts
1 cup low-fat mayonnaise
½ cup plain yogurt
1 cup parmesan cheese, grated
paprika

Drain artichoke hearts and mash well. Add mayonnaise, yogurt and cheese, mixing well. Sprinkle with paprika and bake in casserole dish at 350 degrees for 30 minutes. Serve hot with crackers or bread.

Turkey Loaf

Barbara Kunimura (Finance Dept.)

1½ lbs. ground turkey
1 cup bread crumbs
½ small onion, chopped fine
2 eggs
¼ cup Barb's Local Style Black Beans Sauce (available on O'ahu at Marukai)
¼ cup ketchup

Mix all ingredients and bake in loaf pan at 350 degrees for approximately one hour.

Gravy:
1 can chicken broth
1 Tbsp. Barb's Local Style Black Beans Sauce
cornstarch or flour to thicken

Combine ingredients in saucepan; heat.

Overnight Coffee Cake

Gail Young (Flight Attendant)

⅔ cup butter, softened
1 cup sugar
⅓ cup brown sugar
2 eggs
2 cups flour, sifted
1 tsp. baking powder
½ tsp. salt
1 tsp. cinnamon
1 cup buttermilk

Cream butter and sugars together. Add beaten eggs, stir in remaining ingredients and pour into greased 9-by-13-inch pan. Set in refrigerator overnight.

Topping:
½ cup brown sugar
½ cup chopped walnuts
½ tsp. cinnamon
¼ tsp. nutmeg

Mix topping ingredients and sprinkle over batter. Bake at 350 degrees for 40 minutes.

Kahlua Cheesecake

Gail Young (Flight Attendant)

Crust:
1½ cups chocolate cookie crumbs
⅓ cup melted butter
¼ cup chopped pecans
2 Tbsp. sugar

Filling:
2 8-oz. packages softened cream cheese
⅔ cup sugar
½ cup sour cream
3 eggs
2 Tbsp. Kahlua coffee liqueur
2 Tbsp. vanilla

Topping:
1 cup sour cream
2 Tbsp. sugar
2 Tbsp. Kahlua

Crust: Stir together all ingredients and press into bottom and 1 inch up sides of 9-inch spring-form pan. Bake at 350 degrees for 5 minutes. Cool crust; wrap bottom of pan in foil to prevent leakage.

Filling: Beat cream cheese and sugar well. Add sour cream; mix well. Add eggs one at a time and mix well. Add Kahlua and vanilla. Pour into crust and bake 30-35 minutes. Let sit 5 minutes, then add topping.

Topping: Stir all ingredients until smooth. Spread gently over baked cheesecake and bake 5 more minutes. Let cool completely, then refrigerate.

Cream Cheese Fruit Jell-O

Beverly Wong (Marketing Services)

1 8-oz. package cream cheese
1 cup sugar
4 envelopes Knox gelatin
½ cup cold water
1 cup hot water
2 cans (11-oz.) mandarin oranges
1 cup 7-Up

Beat cream cheese and sugar until smooth. In another bowl, dissolve gelatin with ½ cup cold water and juice from the mandarin oranges. Add 1 cup hot water. Add gelatin mixture to cheese mixture. Add mandarin oranges and 1 cup 7-Up. Pour into 9-by-13-inch pan, greased with mayonnaise. Refrigerate. Cut into squares when firm and serve.

Candy Apple Walnut Pie

Gail Young (Flight Attendant)

6 cups thinly sliced peeled apples
⅔ cup chopped walnuts
½ cup cinnamon red hot candies
⅓ cup plus 2 Tbsp. sugar, divided
⅓ cup flour
2 deep-dish pie crusts, frozen

In large bowl, toss together apples, walnuts, cinnamon candies, ⅓ cup sugar and flour. Pour into one crust.

Break or crumble second frozen crust into small pieces and toss with remaining 2 Tbsp. sugar. Sprinkle over apples. Bake at 350 degrees on preheated baking sheet 55-60 minutes, or until candies melt and bubble up through crust. Cool before serving.

PHONE CALL

FOR Hope DATE 7/10 TIME 2:05 A.M. P.M.

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OF

PHONE AREA CODE NUMBER EXTENSION

MESSAGE Okbe will in tomorrow

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X	PHONED
	RETURNED YOUR CALL
	PLEASE CALL
	WILL CALL AGAIN
	CAME TO SEE YOU
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TOPS FORM 4003

APPENDIX B

Botanical Assessment
Kamehame 990' Water Reservoir Project

Prepared by Char and Associates, September 1991

BOTANICAL ASSESSMENT SURVEY
KAMEHAME RIDGE WATER RESERVOIR
HONOLULU DISTRICT, ISLAND OF O'AHU

by

Winona P. Char

CHAR & ASSOCIATES
Botanical/Environmental Consultants
Honolulu, Hawai'i

Prepared for: PACIFIC PLANNING & ENGINEERING, INC.

September 1991

BOTANICAL ASSESSMENT SURVEY
KAMEHAME RIDGE WATER RESERVOIR
HONOLULU DISTRICT, ISLAND OF O'AHU

INTRODUCTION

A 0.1 m.g. reservoir and associated facilities are planned for the proposed Unit III subdivision on Kamehame Ridge; an access road to service the reservoir is also planned. The reservoir and road will be located at approximately the 975-foot elevation contour.

Field studies to assess the botanical resources on the project site were conducted on 17 September 1991. Notes were made on the general vegetation in the area and a search was made for any threatened and endangered species. Plants which could not be positively determined were collected for later identification in the herbarium and for comparison with the most recent taxonomic treatment of the flora. The scientific names used in this report are in accordance with Wagner et al. (1990).

DESCRIPTION OF THE VEGETATION

The vegetation on the ridge was described earlier by Char (1991) in a report on the Kamehame Ridge 46 Kv overhead transmission line relocation project. The present study recorded similar findings.

Basically, the vegetation on the ridge consists of low, windswept koa-haole shrubland, from 3 to 7 ft. tall. Koa-haole (Leucaena leucocephala) shrubs tend to be shorter nearer the top of the ridge where the winds are stronger and taller on the sides of the ridge where there are depressions or swales. Filling in the matrix is a rather dense cover of Guinea grass (Panicum maximum), from 1 to 3 ft. tall. The grass is very dry and brown at this time of

the year. Scattered through this koa-haole shrubland are trees of kiawe (Prosopis pallida) and shrubs of klu (Acacia farnesiana) and Christmas berry (Schinus terebinthifolius).

Along the existing private road and on rocky outcroppings, annual weedy species and other grass species are more common. These include beggar's tick (Bidens pilosa), virgate mimosa (Desmanthus virgatus), pitted beardgrass (Bothriochloa pertusa), Natal redtop (Rhynchelytrum repens), partridge pea (Chamaecrista nictitans), rattlepod (Crotalaria pallida), Portulaca pilosa, and swollen finger grass (Chloris barbata).

A few native plant species can also be found in this vegetation type on the project site and are presented in Table 1. These natives occur widely throughout the Hawaiian Islands in similar habitats. A large grove of wiliwili trees (Erythrina sandwicensis) can be found in one of the larger swales on the side of the ridge, however, this is outside of the project site. Two native lichens are common on the koa-haole shrubs on the ridge top; these are Teloschites flavicans, a bright orange fruticose lichen, and a Ramilina species, a gray-green lichen.

DISCUSSION

The vegetation on the proposed reservoir site and access road is dominated by koa-haole and Guinea grass, both are introduced or alien species. A few native plants occur on the site. None are officially listed threatened and endangered species (U.S. Fish and Wildlife Service 1989); nor are any proposed or candidate for such status (U.S. Fish and Wildlife Service 1990). In the earlier survey for the relocation of powerlines, Char (1991) recorded similar results.

The proposed reservoir and access road are not expected to have a significant negative impact on the botanical resources of the

TABLE 1. List of Native Species Occurring on Kamehame Ridge Water Reservoir and Road

Scientific name	Common name	[1] Status
FERN ALLIES		
PSILOTACEAE (Whisk Fern Family)		
Psilotum nudum (L.) Beauv.	moa, pipi	I
MONOCOTS		
POACEAE (Grass Family)		
Chrysopogon aciculatus (Retz.) Trin.	golden beardgrass	I?
Eragrostis variabilis (Gaud.) Steud.	emoloa	E
Heteropogon contortus (L.) P. Beauv. ex Roem. & Schult.	pili, pili grass	I?
DICOTS		
MALVACEAE (Mallow Family)		
Sida fallax Walp.	'ilima	I
MENISPERMACEAE (Moonseed Family)		
Cocculus trilobus (Thunb.) DC.	huehue	I
PIPERACEAE (Pepper Family)		
Peperomia leptostachya Hook. & Arnott	'ala'ala wai nui	I
RUBIACEAE (Coffee Family)		
Canthium odoratum (G. Forster) Seem.	alahe'e	I

TABLE 1. (continued)

Scientific name	Common name	[1] Status
SAPINDACEAE (Soapberry Family)		
Dodonaea viscosa Jacq.	a'ali'i	I
STERCULIACEAE (Cacao Family)		
Waltheria indica L.	'uhaloa, hi'aloa, kanakaloa	I?

[1] Status
E = endemic = native only to the Hawaiian Islands
I = indigenous = native to the Hawaiian Islands and also elsewhere throughout the Pacific

the ridge area or the flora of the Hawaiian Islands. No mitigation measures are proposed at this time. There are no botanical reasons to impose any restrictions, impediments, or conditions to the proposed project.

LITERATURE CITED

Char, W. P. 1991. Botanical assessment, Kamehame Ridge 46 Kv overhead line relocation, Honolulu District, island of O'ahu. Prepared for Pacific Planning & Engineering, Inc., Honolulu. June 1991.

U.S. Fish and Wildlife Service. 1989. Endangered and threatened wildlife and plants. 50 CFR 17.11 & 17.12.

_____. 1990. Endangered and threatened wildlife and plants; Review of plant taxa for listing as Endangered and Threatened Species; Notice of review. Federal Register 55(35): 6184-6229.

Wagner, W. L., D. R. Herbst, and S. H. Sohmer. 1990. Manual of the flowering plants of Hawai'i. University of Hawai'i Press and Bishop Museum Press, Honolulu. 2 vols. Bishop Museum Special Publ. No. 83.

APPENDIX C

Archaeological Survey for the Proposed Kamehame 990' Water Reservoir Project

Prepared by Cultural Surveys Hawaii, September 1991

Archaeological Survey for the Proposed Kamehame Ridge Unit III Water Reservoir, Kamehame Ridge, Hawaii Kai, O'ahu TMK 3-9-10:1

by

Douglas F. Borthwick, B.A.
Hallett H. Hammatt, Ph.D.

Prepared for

Pacific Planning and Engineering

by

Cultural Surveys Hawaii
September 1991

Abstract

An archaeological survey was conducted for the proposed .1 M.G. Kamehame Ridge Water Reservoir, Kamehame Ridge, Hawaii Kai, O'ahu. The proposed .1 MG reservoir on Kamehame Ridge adjacent to the existing Nike Road at approximately the 990 ft. elevation. The reservoir site is approximately 1,100 feet north of the planned Kamehame Ridge Unit III Subdivision. A 14 ft. wide by 80 ft. (approx.) long access road will lead from the existing Nike Road to the reservoir site. The proposed reservoir's transmission main will run alongside the Nike Road to the proposed Unit III subdivision and continue to the existing water reservoir located in the newly graded Na Pali Haweo Subdivision.

No evidence of human habitation or sites of any kind were observed within the project area. The results of previous archaeological research specific to Kamehame Ridge (Borthwick and Hammatt, 1991; Shun, 1988 and 1990) were also negative in terms of locating any archaeological sites. Based on the observed absence of historic sites, no further archaeological work is deemed necessary.

Acknowledgements

The authors wish to thank Mr. Alvin Chong and Mr. Ronald Sato of Pacific Planning and Engineering for their professional assistance in coordinating this project.

Maps were provided by Pacific Planning and Engineering and word processing performed by Dr. Vicki Creed.

Dr. Tom Dye of the State Historic Preservation Office of the Department of Land and Natural Resources and Mr. Kanalei Shun shared their knowledge of the Kamehame Ridge area.

Fieldwork was conducted by Messrs. Kaleo Ahina, Tyler Campbell, Ian Earle, Doug Borthwick and William Folk.

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I. Introduction

A. Scope of Work and Methods

On August 9, and September 19, 1991 a field crew of archaeologists conducted a survey for the proposed .1 MG Kamehame Ridge Unit III Water Reservoir on Kamehame Ridge, Hawaii Kai, O'ahu (Figures 1-3). The purpose of the survey was to locate, describe, and evaluate archaeological sites within specific impact areas: reservoir, spillway, access road and transmission lines (main). The scope of work also includes a review of historical background literature and previous archaeological research.

The project was delineated on a site plan, which had been provided by Pacific Planning and Engineering, showing the proposed reservoir and access road (Fig. 4).

The survey procedure consisted of walking up the existing Nike Road to the proposed reservoir and access road site. The proposed site was then closely inspected. The proposed route for the transmission lines will follow the Nike Road corridor, which was surveyed while transiting to and from the reservoir site. Photographs were taken and notes were written, recording the existing conditions along Nike Road and at the reservoir site.

B. Description of Project Area

The project area is located on the crest and west-facing slope of Kamehame Ridge, Hawaii Kai, in the Honolulu District of O'ahu. Kamehame Ridge, which runs generally north to south, is situated between Kalama Valley to the east and Kamiloiki Valley to the west. The project area includes the reservoir and access road site at the 980 ft. elevation, and the transmission lines corridor which will be approximately 3 feet wide

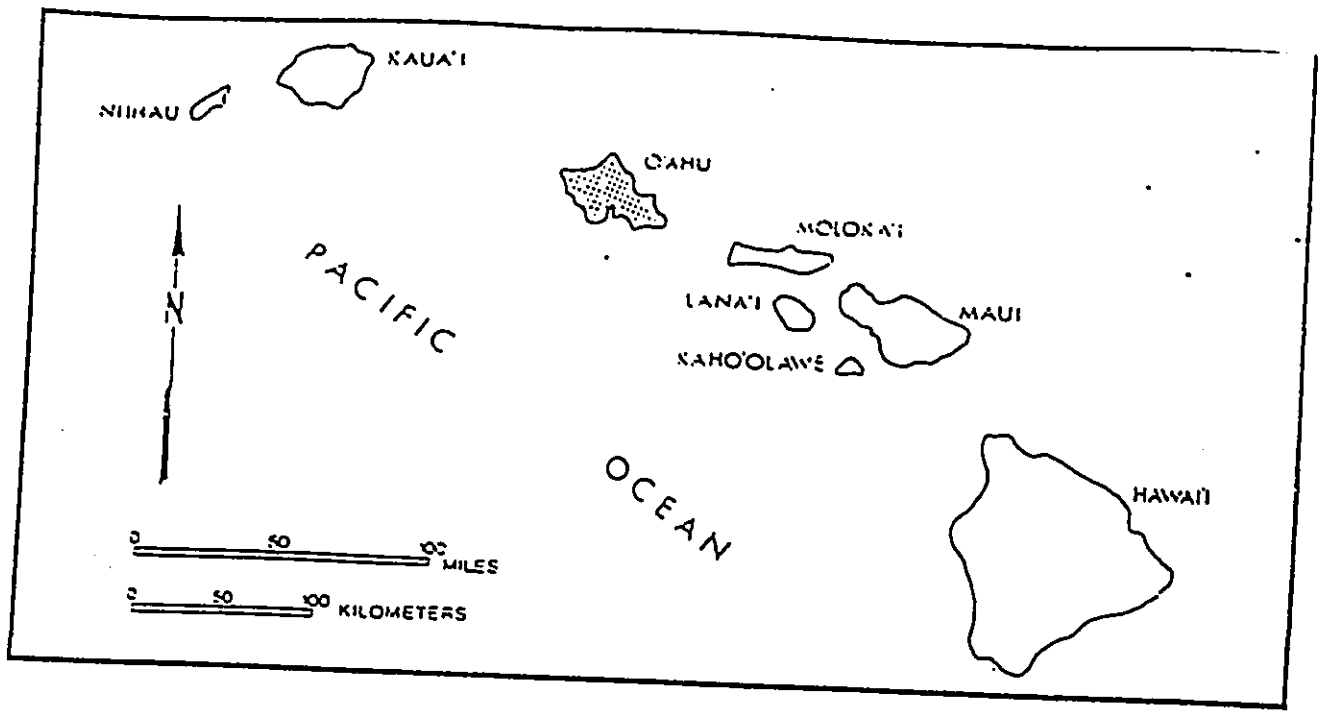

Fig. 1 State of Hawai'i

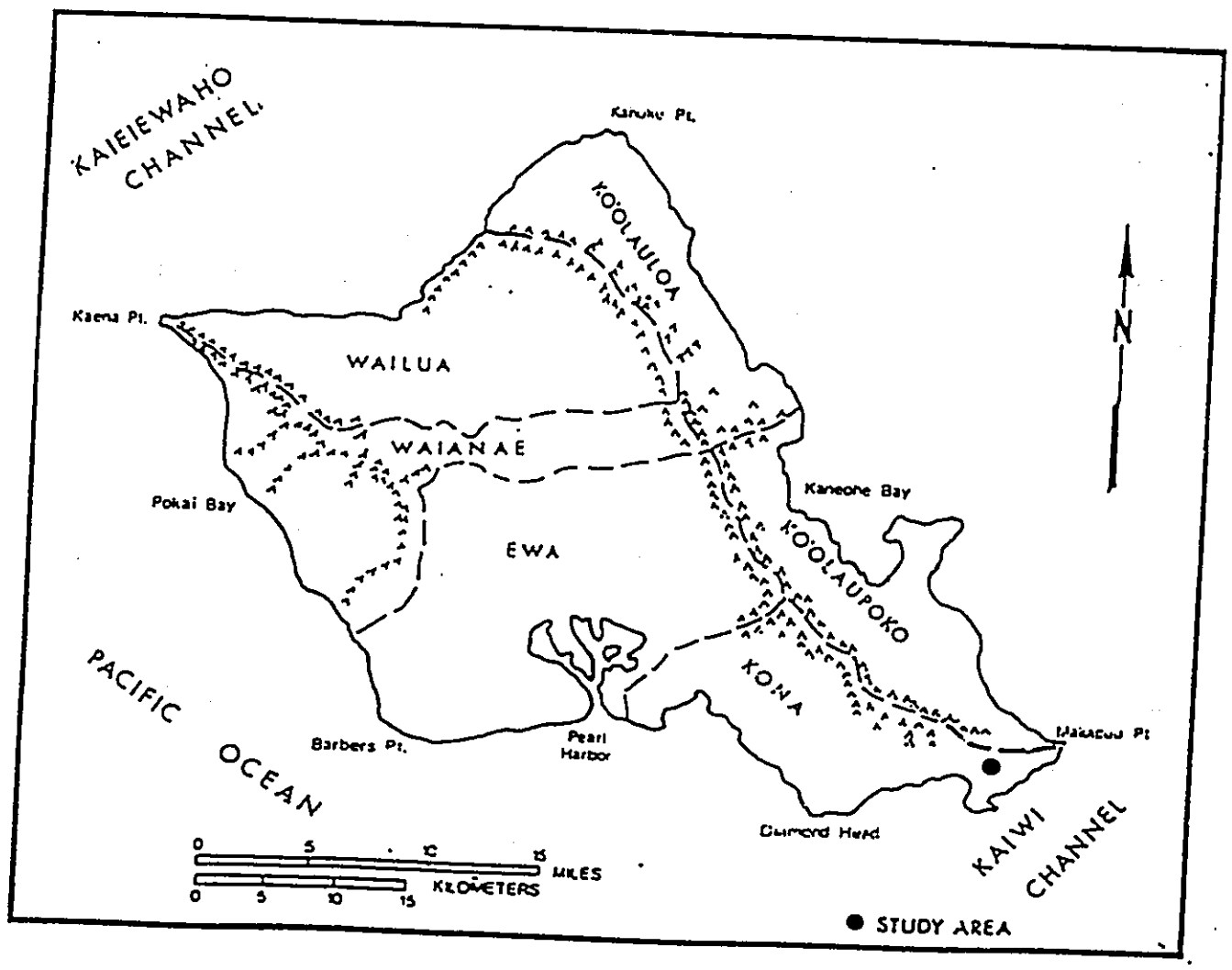

Fig. 2 O'ahu Island Location Map

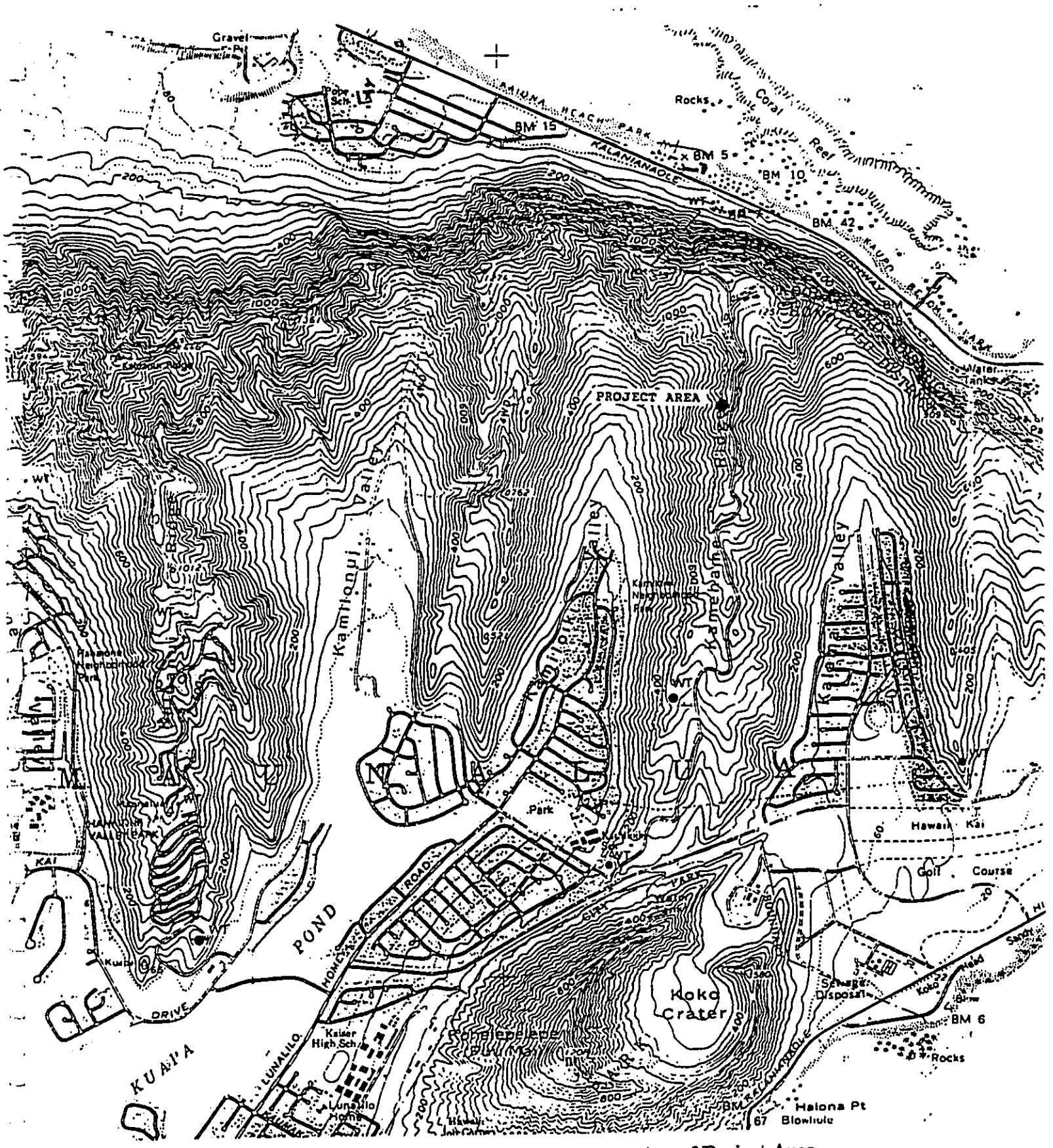

Fig. 3 U.S.G.S. Kokohead Quad (Portion) Showing Location of Project Area

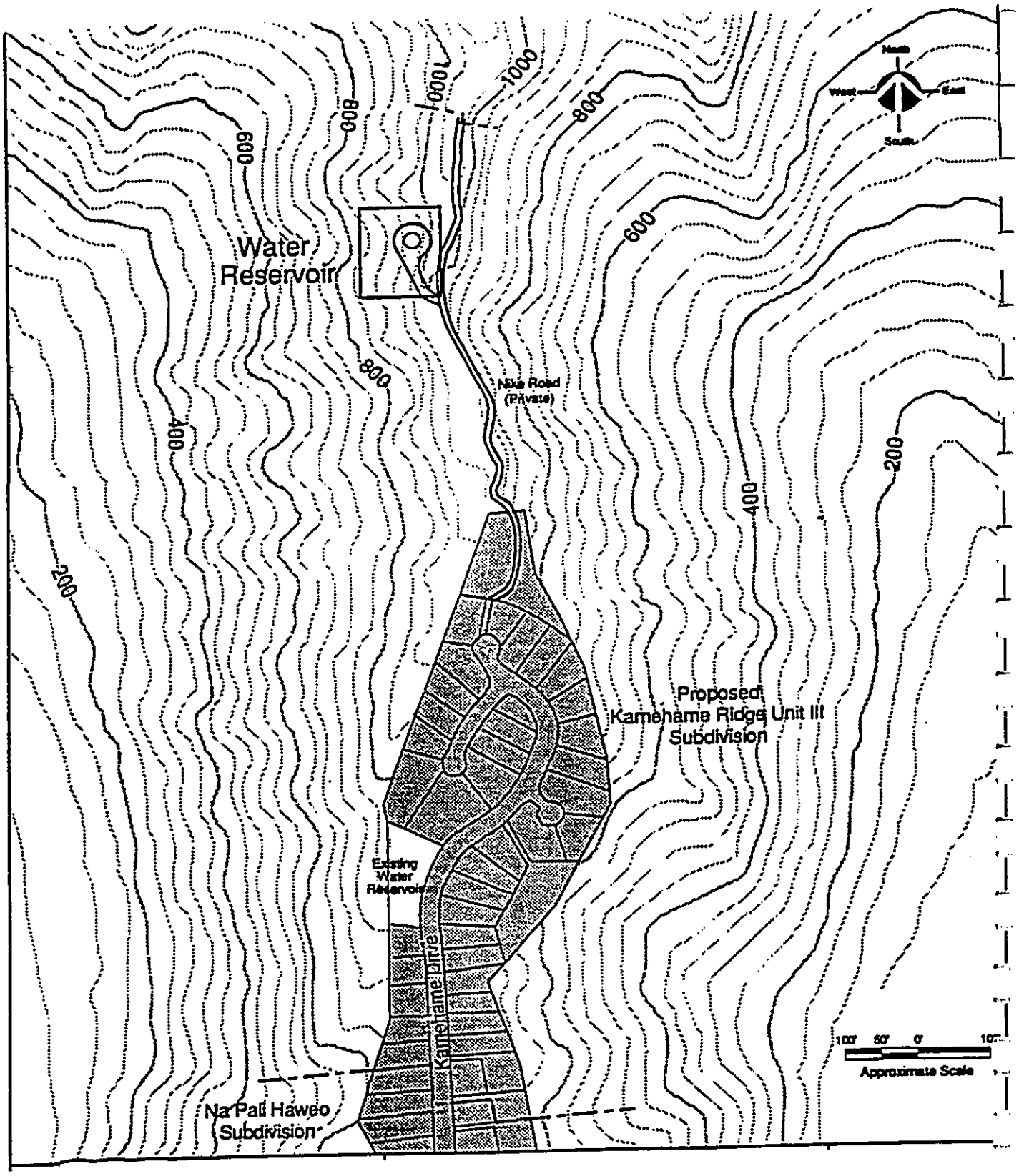

Fig.4 Site Plan for Proposed Reservoir and Access Road From Pacific Planning and Engineering

and 1,100 feet long.

The vegetation within the project area is dominated by introduced species of *Koa haole (Leucaena glauca)*, Christmasberry (*Schinus terebinthifolius*), and various grasses and a few relict native plants. The soils within the project area are classified as (rRK) Rock land and are characterized as having 25 to 90% exposed rock surfaces (Foote et al., 1973). Average annual rainfall is 30 inches per year (Armstrong, ed., 1973:56).

II. Historic Background

Land Unit

The project area is situated within the traditional land unit of Maunalua ("two mountains"; Pukui, Elbert, Mookini, 1974:149).

There are two reports that detail the history, myths, and legends of Maunalua. The two documents are:

1) "Historical/Cultural Essay Report on the Kuapa Pond Area" by Anne H. Takemoto, Pauline King Joerger, Merie-Ellen Fong Mitchell, and Cassandra E. Bareng (1975). This report also includes a certified title search of the Maunalua area with specific references to Kuapa Pond by Herbert Poliala Ewaliko.

2) "Cultural Resources Overview for the Queens Beach Park Feasibility Study, Maunalua, Kona, Oahu" by Marion Kelly, Hiro Kurashima, and Aki Sinoto (1984).

These two reports give in-depth chronological reviews of the land use history of Maunalua. The following is a brief overview based on these reports as well as other sources.

The land unit of Maunalua, in which Kamehame (the Hame tree - *Antidesma platyphylon*; Pukui, Elbert, Mookini, 1974:81) Ridge is situated, is linked with both the Koʻolaupoko and Honolulu districts. Maunalua is recorded in some sources as an *ʻili* (next largest land unit after the *ahupuaʻa*) of Waimānalo in the Koʻolaupoko District. However, even as early as the mid-1850s Maunalua was referred to, in references to Victoria Kamamalu's land claim (LCA 7713) for Maunalua, as being in the Kona District of Oʻahu. The confusion was not cleared up till the 1920s. "The land of Maunalua is an *ʻili* of the *ahupuaʻa* of Waimānalo and originally belonged to Koʻolaupoko District. Maps made as late as 1902 place it in that district. It is situated on the south side of the Koʻolau range and should really be a part of Honolulu District. The many previous acts referring to Oʻahu Districts never did make this sufficiently clear, so in the above amendment (Revised Laws of Hawaii, 1925) of 1932, the descriptions of Honolulu and Koʻolaupoko Districts clarified this point" (J. W. Coulter in Sterling and Summers, 1978:257).

Land Title

Maunalua, as an *ʻili* of Waimānalo, was originally part of the Crown Lands, a possession of Kamehameha III (Interior Department, List of Lands of the King by J. Kaeo Dec. 18, 1847). However, in 1850 Victoria Kamamalu, a granddaughter of Kamehameha I and sister of Kamehameha IV and V, was awarded the *ʻili* of Maunalua as part of Land Commission Award (LCA) 7713. In 1883 Bernice Pauahi Bishop inherited Maunalua (and many other lands) as part of the estate of Ruth Keelikolani. The Bernice Pauahi Bishop Estate was created after her death in 1884 and Maunalua was a part of its land holdings.

Essentially, the *ʻili* of Maunalua has been held by the Kamehamehas since the conquest of Oʻahu (ca. 1795). Hawaii Kai Development Company, Inc. (a subsidiary of Bedford Properties) has certain development rights from Bishop Estate and is tentatively

planning to develop a new subdivision, necessitating the development of new water resource infrastructure on Kamehame Ridge.

Land Use

The Maunalua area is relatively dry, receiving between 20 and 30 inches of rain per year, and has no permanently flowing streams. Thus the type of agriculture practiced during pre-historic (pre A.D. 1776) and early historic times was probably exclusively dry land agriculture. Ethnographic evidence supports this proposition. "According to the last surviving *kama'aina* of Maunalua, sweet potatoes were grown in the small valleys, such as Kamilonui, as well as on the coastal plain. The plain below Kamiloiki and Kealakipapa was known as *ke-kula-o-Kamauwai*. This was the famous potato-planting place from which came the potatoes traded to ships that anchored off Hahaione in whaling days" (E.S.C. Handy, 1940:155).

Maunalua was probably best known for its large fishpond: Keahupua-o-Maunalua (Kuapa Pond). The pond may have covered as much as 523 acres at one time (ca. 1850) (Sterling and Summers, 1978:270). The pond was an early source of revenue for the land owners. In 1856 the pond was leased to the Chun Hoon family for $300 per year, a large sum at the time. In 1873 David Kalakaua leased the pond for $150 per year for a ten-year period. Kalakaua's Estate still controlled the pond's lease into the late 1880s. A 1889 document shows a Chinese firm, Lau Tim & Co., requesting to know if their "application for the lease of the pond at Maunalua will be accepted" (Int. Dept. letter dated November 1889).

The pond is not the only source of fish for Maunalua. The coastline from Makapu'u Point to Maunalua Bay is a very productive near shore and off-shore fishery. This portion of O'ahu's coastline includes Hanauma Bay, which was "a favorite royal

fishing resort" (Fornander Coll. Vol. V, p. 278; from Sterling and Summers, 1978:267). Queen Ka'ahumanu was said to have frequented Hanauma Bay as did Kamehameha V (*Ibid.*). The village site of Kaloko (Queen's Beach area), which J. Gilbert McAllister described in his 1930 *Survey of O'ahu Island* contained evidence that the coastline was an important fishery. Included in the survey findings at Kaloko were two fishing shrines (*ko'a*), a *heiau*, and a canoe house (*halau*) (J.G. McAllister, 1933:59-65). There were also at least three other fishing shrines observed by McAllister within Maunalua.

Commercially organized cattle ranching started ca. 1900 with the lease of most of Maunalua by Maunalua Ranch Co. However, by 1926 this enterprise had folded. In 1932 Alan S. Davis procured a lease for cattle ranching. Alan Davis also went about building a ranch center at the Kaloko area (Queen's Beach). The ranch center included a breakwater and a saltwater swimming pool. These structures, as well as numerous Hawaiian sites at Kaloko, were washed away during the 1946 tidal wave; only a few remnants are still visible.

Military use within Maunalua has included the Marconi Wireless Station which was first operated ca. 1914, the Coast Guard lighthouse at Makapu'u Point, and the Nike Missile Tracking Station (ca. 1950s-1960s).

The Nike Station is located at the top of Kamehame Ridge where it meets the Ko'olau Ridgeline. The Nike Station necessitated a paved access road up Kamehame Ridge, probably the first major construction activity on the ridge. The Nike site is being utilized for other communication activities (i.e. a cellular phone system).

Since the 1960s Maunalua has been part of the fast-paced urbanization of O'ahu. The Kuapa Pond, Kamilonui and Kamiloiki areas are generally defined as Hawaii Kai. The Kalama Valley portion of Maunalua includes housing and a golf course. Ridge top subdivisions are also progressing with Mariner's Ridge (i.e. Kaluanui Ridge) and more

recently Kamehame Ridge.

III. Previous Archaeological Research

Archaeological research specific to Kamehame Ridge has included two reports prepared by Kanalei Shun of Archaeological Associates Oceania (Shun 1988 and 1990). The reports are inventory level surveys: one for Kamehame Subdivision Unit 2 (1988) and the other for *Na Pali Haweo* Transmission Line (1990). The results of these two surveys were negative; no sites of any kind were located. Shun suggested three general reasons for the absence of sites in the higher elevations (200+ ft.) of Kamehame Ridge. These include: distance from the ocean, distance from available fresh water, and "the restrictive natural topography of the ridge, one that does not allow for large cliff overhangs, caves or lava tubes" (Shun, 1988). Cultural Surveys Hawaii (Borthwick and Hammatt (1991) also surveyed a portion of the west-facing slope of Kamehame Ridge, for an electric transmission line and, like the previous surveys, found no archaeological sites.

Other archaeological research also indicates an absence of sites along the higher elevation slopes of ridges in the Maunalua area. Though there have been reported rock shelter sites at Kuliouou (Emory and Sinoto 1961) and burial caves on Kaluanui Ridge (Sites 50-10-15-2902 and 2908), they have been at lower elevations (60 to 100 ft.) and closer to the ocean and/or pond than the present project area.

IV. Survey Results

Survey of the proposed reservoir, access road, and transmission mains and consisted of walking the entire project area which was accessed from the existing Nike Road beyond the planned Kamehame Ridge Unit III Subdivision. Ground visibility was excellent to good which allowed for good overall survey coverage.

The proposed reservoir site is situated on a bedrock knoll on the west side of the existing road (Fig. 5). No surface features of any kind were observed. The road cut exposed an east facing profile on the knoll and inspection of the profile indicated no subsurface culture deposits were present (Fig. 6). The exposure was one of weathered and crumbly bedrock.

No surface features were observed along the proposed transmission line corridor either. Road cuts were inspected to check for the possibility of subsurface features of which none were observed (Fig. 7 and 8). The terrain is mostly crumbly weathered basalt which appears to be subject to periodic slope wash during heavy rains. There was no evidence of any archaeological sites found within the project area.

V. Summary and Recommendations

Maunalua District in which Kamehame Ridge is situated was probably one of the more marine resource-rich areas of O'ahu. Maunalua or Kuapa Pond may have covered some 500 acres at one time. The sheltered bay of Hanauma was said to have been a royal fishing retreat. The coastline of Maunalua includes a wide variety of environmental zones from the rough, rocky shorelines of Makapu'u Point and the deep ocean resource of Kaiwi (Molokai) Channel to the sheltered sandy shoreline and shallow reefs of Maunalua Bay.

Lack of rain or other fresh water resources probably limited plantings to dry land varieties of vegetables, especially sweet potatoes. There is both archaeological and ethnographic evidence that sweet potatoes may have been widely grown at Maunalua. In his 1930 survey of Maunalua (part of an O'ahu Island-wide survey), J. Gilbert McAllister recorded enclosures (#27), stone piles (#28) and terraces (#37) which he attributed to sweet potato farming. E.S.C. Handy (1940) recorded the name *Ke-kula-o-Kamauwai*, a famous potato planting place, which referred to the small valleys and plains of Maunalua.

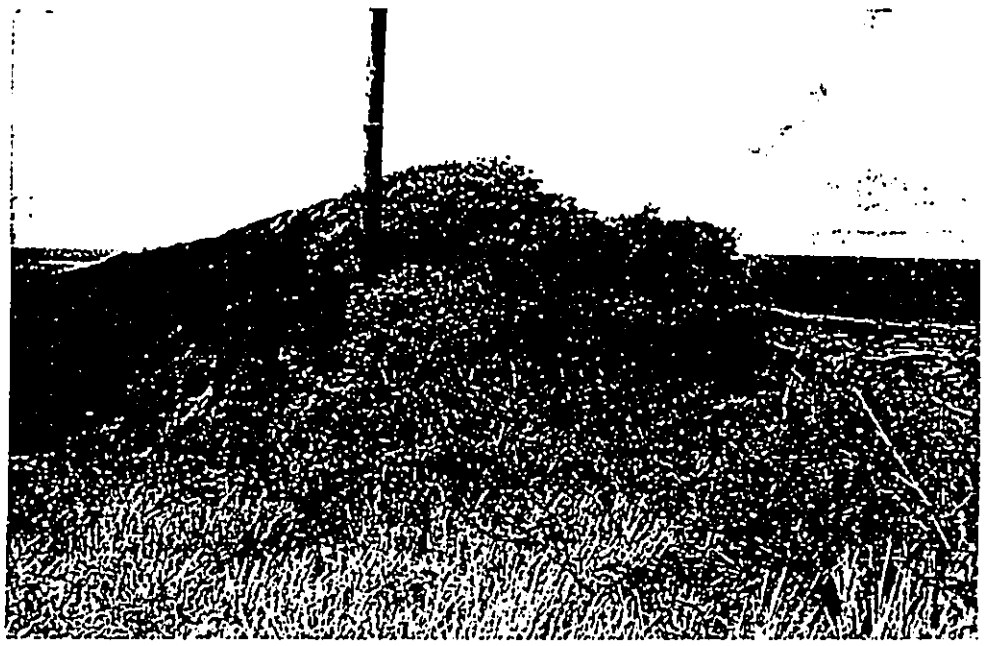

Fig.5 Proposed Reservoir Site, View to South

Fig.6 Proposed Reservoir Site Showing Road Cut Profile, View to West

Fig.7 Proposed Access Road and Existing Nike Road Intersection, View to NW

Fig.8 Nike Road, Proposed Transmission Line(s) Corridor, View to South

Conspicuously absent from the discussions concerning Maunalua is mention of any sites associated with the upper slopes of ridges. Ridge-associated sites like overhang shelters and burial caves (overhangs) are known to exist but are generally at lower elevations and closer to the ocean or the pond.

No further archaeological work is recommended for this reservoir, access road area and corridor for transmission mains due to the absence of any observed archaeological sites. However, in the unlikely event any archaeological sites are discovered during construction, appropriate agencies should be notified immediately.

VI. References Cited

Armstrong, Warwick, ed.
1973 *Atlas of Hawai'i.* U.H. Press, Honolulu.

Borthwick, Douglas F. and Hallett H. Hammatt
1991 Archaeological Survey for the Proposed *Na Pali Haweo* Electrical Transmission Line Relocation Alignment Kamehame Ridge, Hawaii Kai, O'ahu.

Emory, Kenneth P. and Yosihiko H. Sinoto
1961 *Hawaiian Archaeology: O'ahu Excavations.* B.P. Bishop Museum Special Publication 49. Bishop Museum Press, Honolulu.

Foote, Donald E., E.L. Hill, S. Nakamura and F. Stephens
1972 *Soil Survey of the Islands of Kaua'i, Oahu, Maui, Molokai and Lanai, State of Hawaii.* U.S. Dept. of Agriculture. U.S. Government Printing Office, Washington, D.C.

Handy, E.S. Craighill
1940 The Hawaiian Planter. Volume I, B.P. Bishop Museum Bull. 161, Bishop Museum Press, Honolulu.

Kelly, Marion, Hiro Kurashima and Aki Sinoto
1984 *Cultural Resources Overview for the Queens Beach Park Feasibility Study,* Maunalua, Kona, O'ahu, Bishop Museum, Honolulu.

Pukui, Mary K., Samuel H. Elbert and Esther Mookini
1974 *Place Names of Hawaii.* University of Hawaii Press, Honolulu.

Shun, Kanalei
1988 Archaeological Survey of Kamehame Ridge Subdivision, Unit 2, Phase I. hawaii Kai, O'ahu. Archaeological Associates Oceania., Honolulu.

Shun, Kanalei
1990 Archaeological Survey of *Na Pali Haweo* Transmission Line, Kamehame Ridge, Waikiki, O'ahu. Archaeological Associates Oceania, Honolulu.

Sterling, Elspeth P. and Catherine C. Summers
1978 *Sites of O'ahu.* Dept. of Anthropology, B.P. Bishop Museum, Honolulu.

Takemoto, Anne H., Pauline King Joerger, Merie-Ellen Fong Mitchell, and Cassandra E. Bareng
1975 "Historical/Cultural Essay Report on the Kuapa Pond Area"

APPENDIX D

Board of Water Supply Letter of Approval
Kamehame Ridge Water Master Plan

May 1991

RMSA PROJ. NO. 91C18

D1.1
1A

BOARD OF WATER SUPPLY
TY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843

May 15, 1991

Mr. Daniel S. Miyasato
Richard M. Sato and Associates
2046 South King Street
Honolulu, Hawaii 96826

Dear Mr. Miyasato:

Subject: Your Letter of April 11, 1991 on the Kamehame Unit III Water Master Plan

We approve the Kamehame Unit III water master plan dated April 1991.

The water source requirements for the developments should be coordinated with Bishop Estate. Bishop Estate is aware that they must provide a water source for all developments on their lands. In addition, the developer is required to pay our Water System Facilities Charges for transmission facilities.

If you have any questions, please contact Albert Koga at 527-6123.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

EXHIBIT B

REAL PROPERTY MORTGAGE

1)

Certified to be a true, correct and complete copy of the instrument recorded in the Bureau of Conveyances of the State of Hawaii. on 10/24/91 at 8:01 A.M. as Document No. 91-0146052

FOUNDERS TITLE a BUREAU OF HAWAII

By [signature]

LAND COURT REGULAR SYSTEM

AFTER RECORDATION, RETURN BY MAIL ( ) PICK-UP ( )

KAMEHAMEHA SCHOOLS/BISHOP ESTATE

FILE COPY

REAL PROPERTY MORTGAGE

THIS REAL PROPERTY MORTGAGE (the "Mortgage") made this 14th day of October, 1991, by and between HAWAII KAI DEVELOPMENT COMPANY, a Nevada corporation, whose principal place of business and post office address is 6600 Kalanianaole Highway, Suite 300, Honolulu, Hawaii 96825, hereinafter called the "Mortgagor", and the TRUSTEES OF THE ESTATE OF BERNICE PAUAHI BISHOP, whose principal place of business and post office address is 567 South King Street, Suite 200, Honolulu, Hawaii 96813, hereinafter called the "Mortgagee",

WITNESSETH THAT

To secure the repayment of a loan (the "Loan") in the minimum principal amount of EIGHT MILLION AND NO/100 DOLLARS ($8,000,000.00), made by the Mortgagee to the Mortgagor, which principal sum is subject to adjustment as provided in the promissory note, the Loan being evidenced by that certain promissory note of even date herewith, executed by the Mortgagor, as Maker, and payable to the Mortgagee, the provisions of such note and any renewals, extensions or modifications thereof being incorporated herein by reference, being secured hereby and being hereinafter referred to as the "Note";

AND ALSO to secure the observance and performance by the Mortgagor of all covenants, agreements, obligations and conditions required to be observed and performed by the Mortgagor under this Mortgage;

THE Mortgagor DOES HEREBY grant, bargain, sell, assign and convey unto the Mortgagee, its successors and assigns, all and singular:

All of its right, title and fee simple interest in and to the property (the "Land") described in Exhibit "A" annexed hereto and made a part hereof;

TOGETHER WITH all buildings and improvements now located thereon and any and all buildings and improvements thereon during the existence of this Mortgage and all rents, royalties, profits, revenues, income and other benefits arising from the use or enjoyment of all or any portion of the Land or any contract pertaining to the use or enjoyment thereof;

ALSO TOGETHER with any and all awards or payments, including interest thereon, and the right to receive the same, which may be made with respect to the Land and improvements as a result of (a) the exercise of the right of eminent domain, (b) the alteration of

the grade of any street, (c) any other injury to or decrease in the value of the Land and improvements, to the extent of all amounts which may be secured by this Mortgage at the date of receipt of any such award or payment by the Mortgagee, and of the reasonable counsel fees, costs and disbursements incurred by the Mortgagee in connection with the collection of such award or payment, the Mortgagor agreeing to execute and deliver, from time to time, such further instruments as may be required by the Mortgagee to confirm such assignment to the Mortgagee of any such award or payment;

SUBJECT, HOWEVER, to the encumbrances (the "Encumbrances"), if any, described in Exhibit "A";

TO HAVE AND TO HOLD the above described real property, awards, payments and other property together with all rights, privileges and appurtenances thereto belonging (all of such property being hereinafter referred to as the "Mortgaged Property") unto the Mortgagee, absolutely and forever; SUBJECT, HOWEVER, to the Encumbrances.

UPON CONDITION that if the Mortgagor shall well and truly pay to the Mortgagee the principal of the Note, according to its provisions and effect, and if the Mortgagor shall observe and perform all of the covenants, agreements, obligations and conditions to be observed and performed by the Mortgagor under this Mortgage, and if the Mortgagor shall pay the costs of release, then these presents shall be void, and that, subject to the terms hereof, until the happening of an Event of Default (as hereinafter defined), the Mortgagor shall be permitted to use and possess the Mortgaged Property and to use and receive the rents, issues, profits, revenues and other income thereof.

A. Mortgagor's Warranties.

1. Title to Land and Improvements. The Mortgagor warrants and represents that the Mortgagor is the owner in fee simple of the Land, buildings and improvements hereby mortgaged and has good right to grant and convey the same as security under this Mortgage, subject to the Encumbrances; such property is free and clear of any lien or security interest prior to, on a parity with or junior to the lien and security interest of this Mortgage, except for the Encumbrances; and the Mortgagor shall WARRANT AND DEFEND such property unto the holder of the Note, and the successors and assigns of such holder, according to the provisions thereof, against the lawful claims and demands of all persons whomsoever.

B. Mortgagor's Covenants. The Mortgagor hereby covenants and agrees with the Mortgagee as follows:

1. Payment of Note. The Mortgagor will pay to the Mortgagor, at the times and place and in the manner set forth in the Note, the principal and interest due under the Note and all fees, charges and other sums payable under the Note, all according to the provisions thereof, in lawful money of the United States of America, without deduction and without notice or demand.

2. Payment of Real Property Taxes, Assessments, Etc. The Mortgagor will punctually pay and discharge all real property taxes and assessments of every description to which the Mortgaged Property or any part thereof or improvement thereon, or Mortgagor or Mortgagee in respect thereof, are now or may during the existence of this Mortgage be assessed or become liable, whether

assessed to or payable by Mortgagor or Mortgagee; provided, however, that with respect to any assessment made under any betterment or improvement law which may be payable in installments, Mortgagor shall be required to pay only such installments of principal together with interest on unpaid balances thereof as shall become due and payable. If at any time during the existence of this Mortgage there shall be assessed against the Mortgaged Property or any part thereof or any improvement thereon or against Mortgagee in respect thereof any new taxes (other than federal or state net income taxes or any other taxes existing at the commencement of said term) which are in substitution for real property taxes or are in lieu of increases thereof, Mortgagor will also pay, at least ten (10) days before the same become delinquent, all such new taxes.

3. Mortgagee's Costs and Expenses. Mortgagor will also pay to Mortgagee within ten (10) days after the date of mailing or personal delivery of statements therefor, all costs and expenses paid or incurred by Mortgagee and required to be paid by Mortgagor under any provision hereof. If Mortgagor shall become delinquent in the payment of any payments required hereunder to be made by Mortgagor, Mortgagor will also pay to Mortgagee interest thereon from the respective due dates thereof until fully paid at the rate of twelve percent (12%) per year.

4. General Excise Tax. Mortgagor will pay to Mortgagee together with each payment required hereunder to be made by Mortgagor to Mortgagee which is subject to the Hawaii general

excise tax on gross income or any successor or similar tax, an amount which, when added to said payment or other charge (whether actually or constructively received by Mortgagee), shall yield to Mortgagee, after deduction of all such taxes payable by Mortgagee with respect thereto, a net amount equal to that which Mortgagee would have realized therefrom had no such taxes been imposed.

5. Rates and Other Charges. Mortgagor will pay directly before the same become delinquent all utility charges, water and sewer rates, garbage rates and other charges and outgoings of every description to which the Mortgaged Property or any part thereof or improvement thereon, or Mortgagee or Mortgagor in respect thereof, may during said term be assessed or become liable, whether assessed to or payable by Mortgagee or Mortgagor.

6. Improvements Required by Law. Mortgagor will at its own expense make, build, maintain and repair all fences, sewers, drains, roads, curbs, sidewalks and parking areas which may be required by law to be made, built, maintained and repaired upon or adjoining or in connection with or for the use of the Mortgaged Property or any part thereof.

7. Observance of Laws. Mortgagor will keep the Mortgaged Property together with all adjacent land between any street boundary of said premises and the established curb line in a strictly safe, clean, orderly and sanitary condition and observe and perform all laws, ordinances, rules and regulations now or hereafter made by any governmental authority for the time being applicable to the Mortgaged Property and said adjacent land or any

improvement thereon or use thereof, and will indemnify Mortgagee against all actions, suits, damages and claims by whomsoever brought or made by reason of the nonobservance or nonperformance of said laws, ordinances, rules and regulations or of this covenant.

8. Restoration, Repair and Maintenance. Mortgagor will at its own expense from time to time and at all times during the term of this Mortgage, well and substantially restore, repair, maintain, amend and keep all buildings and other improvements now or hereafter built or made on the Mortgaged Property with all necessary reparations and amendments whatsoever in good and safe repair, order and condition, reasonable wear and tear and destruction by unavoidable casualty not herein required to be insured against excepted. Mortgagor will cause periodic inspections to be made by qualified persons of such buildings and other improvements for the purpose of ascertaining and curing infestation thereof by termites, rodents and other pests, and thereafter take all measures as may be required to prevent or cure any damage or destruction by such infestation.

9. Inspection. Mortgagor will permit Mortgagee and their agents at all reasonable times during the term of this Mortgage to enter the Mortgaged Property and examine the state of repair and condition thereof, and will repair and make good at its own expense all defects required by the provisions of this Mortgage to be repaired by Mortgagor of which notice shall be given by Mortgagee or their agents within thirty (30) days after the giving of such notice or such other reasonable time as may be specified

therein. If for any reason Mortgagor shall fail to commence and complete such repairs within thirty (30) days after the giving of such notice or such other reasonable time as may be specified therein, Mortgagee may, but shall not be obligated to, make or cause to be made such repairs and shall not be responsible to Mortgagor or anyone claiming by, through or under Mortgagor for any loss or damage to the occupancy, business or property of any of them by reason thereof, and Mortgagor will pay to Mortgagee on demand, all costs and expenses paid or incurred by Mortgagee in connection with such repairs.

10. Use and Type of Buildings. Mortgagor will use the Mortgaged Property together with the lots set forth in Exhibit "C" attached hereto, solely for the development and sale of a single-family residential subdivision consisting of one hundred ninety-three (193) residential lots (each such lot hereinafter "Lot"). Mortgagor may, but shall not be required to use the Mortgaged Property for the construction of a house and other required building improvements on any of the Lots. Mortgagor will not at any time make or suffer any strip or waste or unlawful, improper or offensive use of the Mortgaged Property. Mortgagor will, at its own expense, grade the Mortgaged Property together with the lots set forth in Exhibit "C" attached hereto, and construct and complete a residential subdivision containing one-hundred ninety-three (193) residential Lots, including mass grading and all roadway improvements in roadway lots, water lines within roadway lots required to serve the said residential Lots, and to

connect the water system of the Board of Water Supply of the City and County of Honolulu to the residential Lots, and all other required utility, drainage and other subdivision improvements as approved by Mortgagee and in accordance with provisions of this Mortgage.

11. Construction and Alterations of Buildings. Mortgagor will not construct or place any buildings or structures, including fences and walls, or other improvements on the Mortgaged Property, nor make or suffer any additions to or structural alterations of the basic structure of any buildings, nor change any grading or drainage, except under the supervision, as appropriate, of a licensed architect or structural engineer or civil engineer and in accordance with complete plans, specifications and detailed plot plans therefor prepared by such an architect or structural or civil engineer and first approved in writing by Mortgagee. No such approval by Mortgagee shall be deemed a warranty or other representation on their part that such plans and specifications or the building or buildings or other improvements therein described are legal, safe or sound.

12. Landscaping. Mortgagor will at its own expense, within ninety (90) days after completion of construction of any house on a Lot, landscape the land in the Lot in accordance with plans prepared by a professional landscape architect, and will at all times during the remainder of the term of this Mortgage, at its own expense maintain such landscaping of such Lot and all adjacent land between any street boundary of such Lot and the established

curb line in a safe, neat and attractive condition. Mortgagor will screen from view from any street, by means of fences, walls or other landscaping approved by Mortgagee in writing, all equipment, materials and supplies kept in open storage on the Mortgaged Property.

Mortgagor will also at its own expense, after grading the Mortgaged Property and constructing and completing the improvements specified in paragraph B.10, control the growth of weeds, trees and other plants on the Lots and keep the Lots in a neat and orderly condition.

13. Bonds. Mortgagor will, before commencing construction of any improvement on the Mortgaged Property costing more than $10,000.00, deposit with Mortgagee (a) written evidence satisfactory to Mortgagee that Mortgagor has or is entitled to sufficient funds, in an amount not less than the total estimated cost thereof, comprising any of (or any combination of) (i) an unconditional loan commitment by a recognized lending institution, (ii) evidence of a bank deposit or other funds available to Mortgagor, or (iii) a copy of a letter of guaranty or letter of credit issued by a recognized financial institution authorized to do business in the State of Hawaii (unless otherwise approved by Mortgagee), together with an executed copy of a construction loan agreement or other financing arrangement by and between Mortgagor and such institution or bank which provides for the orderly disbursement of such funds ratably according to the work completed less only a reasonable retainage, (b) a fully executed copy of the

contract therefor, and (c) copies of the contractor's (or Mortgagor's if it is acting as its own contractor) performance bond and labor and material payment bond naming Mortgagee as obligee in an amount equal to the total estimated cost thereof and in form and with surety satisfactory to Mortgagee, guaranteeing the completion of such work free and clear of all mechanic's and materialman's liens by whomever claimed.

14. Setback Lines. Mortgagor will observe any setback lines affecting the Mortgaged Property as now or hereafter established by any governmental authority having jurisdiction, or any other more restrictive setback lines as shown on the map attached hereto (if any) or herein mentioned in the description of the Mortgaged Property, and will not erect, place or maintain any building or structure whatsoever, except approved fences or walls, or maintain any hedge of a greater height than four feet (4') above the ground level, between any street boundary of the Mortgaged Property and the setback line along such boundary.

15. Fire and Other Casualty Insurance. Mortgagor will at its own expense at all times during said term keep all buildings on the Mortgaged Property insured against loss or damage by fire and other risks of loss as provided by the standard "Causes of Loss-Special Form." In time of war, insurance against war damage will be purchased to the extent such insurance is obtainable at reasonable cost. Insurance will be in an amount as near as practicable to the full replacement cost of the property insured (which amount Mortgagor will review as to sufficiency at least

annually and, if insufficient, will increase). Policies are to be issued by an insurance company authorized to do business in Hawaii and issued in the joint names of Mortgagee and Mortgagor as their interests may appear, and contain a standard mortgagee clause. Mortgagor will pay all premiums on such insurance when due, and will deposit promptly with Mortgagee current certificates of such insurance and, upon request therefor, true copies of such insurance policies. In every case of loss or damage to said buildings, all proceeds of such insurance (excluding the proceeds of any rental value or use and occupancy insurance of Mortgagor) shall be used with all reasonable speed by Mortgagor for rebuilding, repairing or otherwise reinstating the same buildings in a good and substantial manner according to the original plan and elevation thereof or such modified plan conforming to laws and regulations then in effect as shall be first approved in writing by Mortgagee, and Mortgagor will make up from its own funds any deficiency in the insurance proceeds. Mortgagor will at its own expense effect and maintain such other casualty insurance with respect to the Mortgaged Property as Mortgagee may from time to time require with due regard to prevailing prudent business practice as reasonably adequate for their protection. THIS MORTGAGE CONSTITUTES, AND THE MORTGAGOR HEREBY ACKNOWLEDGES RECEIPT OF, WRITTEN NOTICE FROM THE MORTGAGEE THAT THE MORTGAGEE MAY NOT MAKE THE GRANTING OF THE LOAN CONTINGENT UPON THE MORTGAGOR PROCURING ANY REQUIRED INSURANCE WITH AN INSURANCE COMPANY DESIGNATED BY MORTGAGEE.

16. Indemnity. Mortgagor will indemnify and hold Mortgagee harmless from and against all claims and demands for loss or damage, including property damage, personal injury and wrongful death, arising out of or in connection with the use or occupancy of the Mortgaged Property by Mortgagor or any other person under Mortgagor, or any accident or fire on the Mortgaged Property or any nuisance made or suffered thereon, or any failure by Mortgagor to keep the Mortgaged Property or any adjacent sidewalks in a safe condition, and will reimburse Mortgagee for all their costs and expenses, including reasonable attorney's fees incurred in connection with the defense of any such claims, and will hold all goods, materials, furniture, fixtures, equipment, machinery and other property whatsoever on the Mortgaged Property at the sole risk of Mortgagor and save Mortgagee harmless from any loss or damage thereto by any cause whatsoever.

17. Expenses of Mortgagee. Mortgagor will pay to Mortgagee, within ten (10) days after the date of mailing or personal delivery of statements therefor, (a) all costs and expenses, including reasonable attorney's fees paid or incurred by Mortgagee, but required to be paid by Mortgagor under any covenant herein contained or paid or incurred by Mortgagee in enforcing any of Mortgagor's covenants herein contained, in protecting themselves against any breach thereof, in recovering possession of the Mortgaged Property or any part thereof, in collecting or causing to be paid any delinquent taxes or other charges hereunder payable by Mortgagor, or in connection with any litigation (other than

condemnation proceedings) commenced by or against Mortgagor to which Mortgagee shall without fault be made a party, and (b) a reasonable fee for reviewing and processing any request by Mortgagor for Mortgagee's consent or approval, which fee shall be a flat-rate service charge as established by the policy of Mortgagee then in effect or a sum equal to all costs and expenses paid or incurred by Mortgagee, including, without limitation, reasonable fees of attorneys and other consultants retained by Mortgagee and the costs of Mortgagee's regular salaried staff in connection therewith, whichever is greater. All such costs, expenses and fees shall bear interest as provided in paragraph 3.3 hereof.

18. Liens. Mortgagor will not commit or suffer any act or neglect whereby the Mortgaged Property or any improvement thereon or the estate of Mortgagor therein shall at any time during the term of this Mortgage become subject to any attachment, judgment, lien, charge or encumbrance whatsoever, except as herein expressly provided, and will indemnify and hold Mortgagee harmless from and against all loss, cost and expense with respect thereto. Mortgagor will not incur any cost or expense in excess of Ten Thousand Dollars ($10,000.00) in respect of the Mortgaged Property, including, without limitation, contractor's, materialman's, architect's and engineer's charges, which, if unpaid, would give rise to a lien against the Mortgaged Property or any improvement thereon, or the estate of Mortgagor or Mortgagee therein, until Mortgagor has given to Mortgagee written evidence satisfactory to

Mortgagee that Mortgagor has or is entitled to sufficient funds to pay such costs or expenses in full.

19. Liability Insurance. Mortgagor will, at its own expense, effect and maintain during the term of this Mortgage comprehensive general liability insurance with respect to the Mortgaged Property under policies naming Mortgagee as additional assured in an insurance company authorized to do business in Hawaii with minimum limits of not less than $2,000,000.00, such amounts being for injury to one or more persons in any one accident or occurrence and for property damage, respectively, or such higher limits as Mortgagee may from time to time establish with due regard to prevailing prudent business practice as reasonably adequate for their protection, and will from time to time deposit with Mortgagee current certificates of such insurance and, upon request therefor, true copies of such insurance policies.

20. Transfer. Except to the limited extent permitted under paragraph C.3 hereof as to mortgages and under paragraphs C.6 and C.7 as to partial releases of this Mortgage, Mortgagor will not sell, assign, transfer or otherwise dispose of all or any part of the Mortgaged Property, without the prior written consent of the Mortgagee, which shall not be unreasonably withheld or delayed.

21. No Leasing. Mortgagor shall not lease or part with possession of all or any portion of the Mortgaged Property and any leasing or purported leasing shall be null and void. There is no intent to nor right granted under this Mortgage for any residential dwellings constructed on any of said Lots to be used or occupied by

third party purchasers or others on a leasehold basis (other than as a sales model or sales office by the Mortgagor).

22. Air and Other Rights. Mortgagor will not at any time during the term of this Mortgage lease, assign, surrender or otherwise transfer any air rights or other rights whatsoever on, over, under or in respect to the Mortgaged Property, other than easements for drains, sewers, water, electricity or other utilities with the approval in writing of Mortgagee, and Mortgagee shall join in the creation and granting of any such easements which are necessary or appropriate to develop the Mortgaged Property as contemplated herein.

23. Development and Subdivision of Mortgaged Property. Mortgagor will, at its own expense complete the development of the Mortgaged Property into a residential subdivision by subdividing the Mortgaged Property and constructing and completing thereon the subdivision improvements specified in paragraph B.10 suitable for the use of the Mortgaged Property specified in paragraph B.10, all as approved by Mortgagee. Mortgagee and Mortgagor also acknowledge and agree that Mortgagor will at Mortgagor's sole cost and expense prior to April 30, 1995, subdivide the land described in Exhibit "A-1" attached hereto into individual residential lots, roadways and common areas in accordance with a subdivision map first approved by the Mortgagee. Mortgagor, with the approval of Mortgagee, will initially prepare a large lot subdivision such that the land described in Exhibit "A-1" will be a single subdivided lot. Upon completion of such large lot subdivision, Mortgagee

shall convey such premises to Mortgagor. Mortgagee and Mortgagor will amend the Note and this Mortgage to extend the respective terms thereof to such property, or enter into a new promissory note and mortgage for such property, which new promissory note and mortgage shall contain substantially the same terms and conditions contained in this Mortgage, including without limitation the preconditions to the extension of the note contained in paragraph C.9 and the Base Release Price and Appraised Value for the individual lots set forth in paragraph C.7 of this Mortgage. Mortgagee agrees to cooperate with Mortgagor in obtaining all necessary and appropriate governmental permits and approvals relating to the development, subdivision and improvement of the Mortgaged Property and the construction thereon as contemplated by paragraph B.10 hereof and/or this paragraph B.23.

24. Acceptance of Storm Waters. Mortgagor will not in any way hinder or obstruct the drainage of storm waters from upper and adjacent lands across the Mortgaged Property and shall contain said waters in drainage systems to be constructed by Mortgagor at its expense, as required by Mortgagee, and in natural water courses on the Mortgaged Property. Mortgagor will, at all times, repair, maintain and keep the drainage systems and natural water courses which may be on the Mortgaged Property in good order and condition and free from any obstructions. Mortgagor will not, without the prior written approval of Mortgagee, (a) change the grading of the Mortgaged Property, or (b) change the location of any drainage systems or natural water courses which may be on the Mortgaged

Property, or (c) concentrate the flow of storm waters from the Mortgaged Property except in drainage systems or natural water courses that are approved by Mortgagee and available for such purpose.

25. Strip, Waste, Hazardous Waste. The Mortgagor will not make or suffer any strip or waste or any unlawful, improper or offensive use of the Mortgaged Property or any act of negligence by which the Mortgaged Property or any interest therein shall become liable to seizure or attachment or mesne or final process of law.

Without limiting the generality of the foregoing, Mortgagor shall keep and maintain the Mortgaged Property, including without limitation, the groundwater on or under the Mortgaged Property, in compliance with, and shall not cause or permit the Mortgaged Property or any portion thereof to be in violation of, any federal, state or local laws, ordinances or regulations, now or hereafter in effect, relating to environmental conditions, industrial hygiene or Hazardous Materials (as hereinafter defined), on, under or about the Mortgaged Property, including without limitation, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. Section 9601, et seq., the Hazardous Materials Transportation Act, 49 U.S.C. Section 1801, et seq., the Resource Conservation and Recovery Act, 42 U.S.C. Section 6901, et seq., the Clean Water Act, 33 U.S.C. Section 1251, et seq., the Clean Air Act, 42 U.S.C. Section 7401, et seq., the Toxic Substances Control Act, 15 U.S.C. Sections 2601 through 2629, the Safe Drinking Water Act, 42 U.S.C. Sections 300f

through 300j, and any similar state and local laws and ordinances and the regulations now or hereafter adopted and published and/or promulgated pursuant thereto (collectively the "Hazardous Materials Laws").

The Mortgagor shall not use, generate, manufacture, treat, handle, refine, produce, process, store, discharge, release, dispose of or allow to exist on, under or about the Mortgaged Property any flammable explosives, radioactive materials, asbestos, organic compounds known as polychlorinated biphenyls, chemicals known to cause cancer or reproductive toxicity, pollutants, contaminants, hazardous wastes, toxic substances or related materials, including without limitation, any substances defined as, or included in, the definition of "Hazardous substances", "hazardous wastes", "hazardous materials", or "toxic substances" under the Hazardous Materials Laws (collectively "Hazardous Materials"), except in compliance with all applicable laws in the State of Hawaii. Furthermore, Mortgagor shall not allow to exist on, under or about the Mortgaged Property any underground storage tanks or underground deposits.

Mortgagor shall immediately advise Mortgagee in writing of (i) any and all enforcement, clean up, removal, mitigation or other governmental or regulatory actions instituted, contemplated or threatened pursuant to any Hazardous Materials Laws affecting the Mortgaged Property, (ii) all claims made or threatened by any third party against Mortgagor or the Mortgaged Property relating to damage, contribution, cost recovery, compensation, loss or injury

resulting from any Hazardous Materials (the matters set forth in clauses (i) and (ii) above are hereinafter referred to as "Hazardous Materials Claims"), (iii) Mortgagor's discovery of any occurrence or condition on the Mortgaged Property or any real property adjoining or in the vicinity of said land which could subject Mortgagor, Mortgagee or the Mortgaged Property to any restrictions on ownership, occupancy, transferability or use of the Mortgaged Property under any Hazardous Materials Laws.

Mortgagee shall have the right to join and participate in, as a party if it so elects, any settlements, remedial actions, legal proceedings or actions initiated in connection with any Hazardous Materials Claims and to have its reasonable attorneys' fees incurred in connection therewith paid by Mortgagor. Mortgagor shall be solely responsible for and shall indemnify and hold harmless Mortgagee and its employees, agents, successors and assigns from and against any loss, damage, cost, expense or liability directly or indirectly arising out of or attributable to the use, generation, manufacture, treatment, handling, refining, production, processing, storage, release, threatened release, discharge, disposal or presence of Hazardous Materials, on, under or about the Mortgaged Property by or through Mortgagor, including without limitation: (a) the costs of any required or necessary repair, cleanup or detoxification of the Mortgaged Property, and the preparation and implementation of any closure, remedial or other required plans; and (b) all reasonable costs and expenses

incurred by Mortgagee in connection therewith, including, without limitation, reasonable attorneys' fees.

26. T. V. Antennas. Mortgagor will not erect, place or maintain any television or other antennas on the Mortgaged Property visible from any point outside of the Mortgaged Property.

C. Mutual Agreement.

1. Appraisal. Whenever this Mortgage provides that the fair market value of land shall be determined by appraisal, such fair market value shall be determined by three (3) qualified real estate appraisers, one to be appointed by each of the parties hereto, and Mortgagor and Mortgagee each shall promptly name one such appraiser and give written notice thereof to the other party, and in case either party shall fail so to do within ten (10) days after such notice of the appointment of the first appraiser, the party naming the first appraiser may apply to any person then sitting as judge of the Circuit Court of the judicial circuit in which said premises are located for appointment of a second appraiser, and the two appraisers thus appointed in either manner shall appoint a third appraiser, and in case of their failure so to do within ten (10) days after appointment of the second appraiser, either party may have the third appraiser appointed by such judge, and the three appraisers so appointed shall proceed to determine the matter in question, and the decision of said appraisers or a majority of them shall be final, conclusive and binding on both parties hereto. Mortgagor and Mortgagee each shall pay one-half

(1/2) of all proper costs and expenses of such appraisal other than attorney's fees.

2. Condemnation. Should all or any part of the Mortgaged Property be taken by eminent domain, the Mortgagee is hereby empowered to collect and receive the award payable to Mortgagor for any Mortgaged Property so taken (all of which Mortgagor hereby assigns to Mortgagee). In the event of any such taking (other than a taking for governmental occupancy for a limited or specified period), the Mortgagee shall release from the lien of this Mortgage the properties so taken upon receipt by and deposit with the Mortgagee of the proceeds of such award, provided that such release shall not impair the Mortgagee's right to claim additional compensation in such proceeding. The proceeds of the award payable to Mortgagor for any part of the Mortgaged Property taken by eminent domain (including a taking for governmental occupancy of a limited or specified period) received by the Mortgagee as aforesaid shall be applied and disbursed by the Mortgagee as provided in subparagraphs a and b hereof. If, prior to the receipt by the Mortgagee of such award (whether paid by the condemning authority in a lump sum or in installments), the Mortgaged Property shall have been sold on foreclosure of this Mortgage, the Mortgagee shall have the right to receive said lump sum award or the installments of said award due and payable subsequent to such sale, as the case may be, to the extent of any indebtedness secured hereby remaining unpaid, together with legal interest thereon, and of the reasonable counsel fees costs and

disbursements incurred by the Mortgagee in connection with the collection of such award. Any portion of the compensation and damages otherwise payable to the Mortgagor hereunder shall be paid as provided in the Authorized Mortgage, as defined in paragraph C.4 below.

a. Disposition of Condemnation Proceeds. All proceeds of any award payable to Mortgagor for any Mortgaged Property taken by eminent domain (except the proceeds of any award payable to Mortgagor for any part of the Mortgaged Property taken by eminent domain for governmental occupancy for a limited or specified period) received by Mortgagee, less the cost if any, incurred by the Mortgagee with respect thereto, shall be allocated and applied between Mortgagee and Mortgagor as follows:

(1) If the condemning authority or the court assigns a value per Lot in arriving at the total condemnation award for the taking then that value shall be deemed to be the sales price of the Lot for purposes of calculating the Release Price due to Mortgagee in accordance with paragraph C.7 of this Mortgage for each Lot so taken. Mortgagee shall retain and be paid from the condemnation award proceeds an aggregate amount equal to the Release Price(s) for each such Lot so calculated, and the balance, if any, shall be paid to the Mortgagor.

(2) If the condemning authority or the court do not assign any per Lot value then and in such event the condemnation award proceeds shall be allocated among the Lots so taken as set by mutual agreement of the Mortgagee and the Mortgagor

based on sales of comparable Lots within the last twelve (12) months, or if no sales of Lots have been made within the last twelve (12) months, then based on sales of comparable lots in East Honolulu. The allocated condemnation award proceeds to each such Lot shall be deemed the sales price of the Lot for purposes of calculating the Release Price due to Mortgagee in accordance with the procedure and formula contained in paragraph C.7 of this Mortgage. If the Mortgagee and the Mortgagor fail to agree upon the allocation of the condemnation award among the Lots so taken within thirty (30) days after Mortgagee's receipt of the condemnation award proceeds, then the allocation of the condemnation award among the Lots and the resulting sales price of the Lot for purposes of this paragraph shall be determined by the appraisal procedure set forth in paragraph C.1. The appraisers shall allocate the condemnation award and set the sales price for each of the Lots so taken based upon the then fair market value of the respective Lots.

b. Condemnation for a Limited or Specified Period. The proceeds of any award for any part of the Mortgaged Property taken by eminent domain for governmental occupancy for a limited or specified period which is less than the term of this Mortgage received by Mortgagee, less the cost, if any, incurred by Mortgagee with respect thereto, shall be applied and disbursed as follows:

(i) If such award is paid by the condemning authority in a lump sum, such portion thereof as shall equal the sum of the aggregate installments of principal (if any) and

interest that would otherwise have accrued during such limited or specified period of governmental occupancy shall be retained by Mortgagee and applied in the order of maturity to the payments and prepayments of the installments of principal (if any) and interest that would otherwise have accrued during such period, but without prepayment premium or penalty, and any remaining balance of such proceeds shall be paid to Mortgagor.

(ii) If such award is paid by the condemning authority in installments, each installment shall be applied first to payments of principal (if any) and interest that accrued during such period, but without prepayment premium or penalty, and any remaining balance of such installment shall be paid to Mortgagor.

3. Consent to Mortgage. Mortgagor will not without further consent of Mortgagee, mortgage the Mortgaged Property to any bank, insurance company or other established lending institution as mortgagee. The amount secured by all such mortgages shall not exceed the fair market value of the Mortgaged Property and all buildings and other improvements built on the Mortgaged Property or to be built and paid for with the proceeds of such mortgage, provided that Mortgagor shall, upon execution of such mortgage, promptly deliver a true copy thereof to Mortgagee. If Mortgagee shall believe that the amount secured by such mortgages exceeds said fair market value, Mortgagor will, promptly on demand by Mortgagee and at its own expense, cause such value to be determined by one qualified real estate appraiser satisfactory to Mortgagee and, if the amount so secured shall exceed said value as

determined by such appraiser, will promptly reduce the amount so secured to said value; provided, however, that if said value as determined by such appraiser shall be equal to or exceed the amount so secured, Mortgagee shall reimburse to Mortgagor its cost for such appraisal.

Mortgagee hereby agrees that, provided that Mortgagor is not then in default of Mortgagor's obligations under this Mortgage, Mortgagee shall, upon request of Mortgagor, review and amend to Mortgagee's satisfaction, if necessary, and execute and deliver such estoppel certificates and reaffirmation statements (in both cases, in recordable form, if requested) in favor of Mortgagor, or any mortgagee of Mortgagor's interest hereunder, or any other person or entity reasonably requiring the same, certifying (if such is the case in each instance) that this Mortgage is in full force and effect and unmodified (or stating the modifications), that Mortgagor is not in default, that to the knowledge of Mortgagee no event has occurred which, with notice or the lapse of time or both, would constitute a default by Mortgagor hereunder.

4. Protection of Mortgage. The mortgagee of any authorized mortgage (hereinafter called the "Authorized Mortgage") pursuant to the provisions of paragraph C.3 above (hereinafter called the "Lender"), shall enjoy the benefits and/or protection of the following:

a. Notice of Defaults. Mortgagee shall send by certified or registered mail to Lender, a notice of any default by Mortgagor under this Mortgage and/or the Note, at the same time as

and whenever any such notice of default shall be given by Mortgagee to Mortgagor, addressed to Lender at the last address furnished to Mortgagee. No notice by Mortgagee shall be deemed to have been given unless and until a copy thereof shall have been so given to Lender. Mortgagor irrevocably directs that Mortgagee accept, and Mortgagee agrees to accept, performance and compliance by Lender of and with any term, covenant, agreement, provision, condition or limitation on Mortgagor's part to be kept, observed or performed hereunder with the same force and effect as though kept, observed or performed by Mortgagor.

b. Lender's Right to Cure. Mortgagee agrees that it will not accelerate the Note, foreclose this Mortgage and/or exercise any other remedies because of any default or breach on the part of the Mortgagor if Lender, within one hundred twenty (120) days after service of written notice on Lender (as evidenced by a return receipt, by mail or delivery, executed by or on behalf of Lender or its assigns) by Mortgagee of Mortgagee's intention to accelerate the Note, foreclose this Mortgage and/or exercise any other remedies because of any default or breach on the part of the Mortgagor, shall:

(1) Cure such breach or default if the same can be cured by the payment or expenditure of money provided to be paid under the terms of this Mortgage, specifically including, but not limited to, the payment of any installment under the Note, or if such default or breach is not so curable, commence, and thereafter pursue to completion, the steps and proceedings for foreclosure by

sale, or by exercise of power of sale pursuant to and under the Authorized Mortgage; and

(2) Keep and perform all of the covenants and conditions of this Mortgage requiring the payment or expenditure of money by the Mortgagor until such time as the Mortgaged Property shall be sold upon foreclosure, or by the exercise of a power of sale;

provided, however, that if Lender shall fail or refuse to comply with conditions contained in this paragraph, then and thereupon Mortgagee shall be released from the covenants of forbearance herein contained with respect to such breach or default.

c. Lender's Right to Assume Mortgage. Any person that acquires title to the Mortgaged Property (or so much thereof that has not then been released as provided in paragraph C.7 below) by foreclosure of the Authorized Mortgage or by a deed in lieu of such foreclosure, (or if the Lender so acquires title, the Lender's immediate transferee of such Mortgaged Property) may, upon written request by Lender to Mortgagee made at least ten (10) days prior to acquiring title to such Mortgaged Property, assume the Note and this Mortgage for the remainder of the term of the Note and this Mortgage, with the same covenants, conditions and agreements (except for any requirements which have been satisfied by Mortgagor prior to termination) as are contained therein. Mortgagee's obligation to allow assumption of the Note and this Mortgage shall be conditioned as follows: (i) Lender has remedied and cured all monetary defaults under the Note and/or Mortgage and has remedied

and cured or has commenced and is diligently completing the cure of all nonmonetary defaults of Mortgagor susceptible to cure by any party other than by Mortgagor, and (ii) that Lender pays all costs and expenses of Mortgagee, including reasonable attorneys' fees, escrow fees and recording charges, incurred in connection with the assumption of the Note and this Mortgage.

d. No Surrender or Amendment. Mortgagee agrees not to accept a voluntary surrender of the Mortgaged Property at any time while the Authorized Mortgage shall remain a lien on the Mortgaged Property without securing the prior written consent of the Lender; and Mortgagee further agrees for the benefit of Lender that, so long as the Authorized Mortgage shall remain a lien on the Mortgaged Property, Mortgagee will not amend or alter any terms or provisions of the Note or this Mortgage, without securing the prior written consent of Lender.

e. Conveyance of Mortgaged Property by Lender. The prior written consent of Mortgagee shall not be required:

(1) To a transfer of the Mortgaged Property at foreclosure sale under the Authorized Mortgage, under judicial foreclosure or by a deed in lieu of foreclosure; or

(2) To any subsequent conveyance by Lender if Lender is the purchaser at such foreclosure sale under the Authorized Mortgage, under judicial foreclosure or by a deed in lieu of foreclosure;

provided that in either of such events Lender forthwith gives notice to Mortgagee in writing of any such conveyance, setting

forth the name and address of the transferee assuming and agreeing to perform all of the obligations of the Note and this Mortgage, together with a copy of the document by which such transfer was made. Any subsequent transfer of the Mortgaged Property shall be subject to the conditions relating to assignment as set forth in this Mortgage. Lender shall be liable to perform the obligations of the Mortgagor under this Mortgage only so long as Lender holds title to the Mortgaged Property.

g. Foreclosure Is Not a Default. In the event of a default by Mortgagor under the Authorized Mortgage, and Lender exercises its rights under the Authorized Mortgage for the foreclosure of the Authorized Mortgage pursuant to a power of sale, by judicial proceedings or other lawful means, or takes other actions under its Authorized Mortgage to protect its collateral or rights thereunder, such foreclosure or other actions shall not constitute an event of default or default of this Mortgage.

h. No Obligation Re Additional Property. Notwithstanding anything contained herein to the contrary, Lender shall have no obligations with respect to the property described in Exhibit "A-1" attached hereto unless the subdivision of such property has been completed, such property has been conveyed by Mortgagee to Mortgagor pursuant to the provisions of paragraph B.23 herein, and the Note and this Mortgage have been amended to extend the respective terms thereof to such property.

5. Covenants, Conditions and Restrictions; Homeowners Association. Mortgagee will join with Mortgagor in the execution

of, or amendment for the purpose of annexation of additional areas subject to, a suitable declaration of covenants, conditions and restrictions (the "Declaration") encumbering the Lots and requiring the grantee of each Lot to become a member of and pay fees and assessments to an association of homeowners (the "Association") to be formed for the purpose of maintaining a private park and certain other common areas within the demised land as shall have been approved for such purpose by Mortgagee.

Grantee of each Lot Deed (as defined in paragraph C.6) shall be deemed to be the owner of the Lot. Mortgagor at all times during said term shall be deemed to be the owner of all Lots which have not been released from this Mortgage for all purposes of the Declaration and the bylaws and shall have all the rights, privileges, duties and obligations of such owners.

The Declaration and bylaws of the Association shall be prepared by or at the expense of Mortgagor, subject to review and consent by Mortgagee, which such consent shall not be unreasonably withheld. Changes to the Declaration or bylaws shall be made as necessary or appropriate as determined by mutual agreement of the parties, and shall be prepared by and at the expense of Mortgagor.

6. Partial Release of Mortgage. Pursuant to paragraph B.10 above, Mortgagor will use the Mortgaged Property solely for and as a part of the development and sale of a single-family residential subdivision consisting of one hundred ninety-three (193) residential lots. As a part of the development of the Mortgaged Property, Mortgagor has entered or will enter into a

sales program for the sale of the Lots to third party buyers and convey to the respective buyers thereof, the respective Lot by warranty deed (herein "Lot Deed"). Mortgagee agrees, in consideration of the payment to Mortgagee of the Release Price (as hereinafter defined) for such Lot, it shall partially release the lien of this Mortgage as to such Lot. Every Lot Deed shall be placed in a mutually satisfactory escrow at Mortgagor's expense with instructions to withhold delivery of each Lot Deed until the escrow agent shall be in a position to immediately deliver to Mortgagee the Release Price for such Lot. Mortgagee further agrees, in consideration of the payment to Mortgagee by Mortgagor on or before April 30, 1995 (subject to extension in accordance with paragraph C.9 hereinbelow) of the fixed Release Price set forth in Exhibit "B" attached hereto for lot 37, Phase I (the "Common Area Lot"), and lot 38, Phase I (the "Park Lot"), it shall partially release the lien of this Mortgage as to such Common Area Lot and Park Lot. Notwithstanding anything contained herein to the contrary, the Release Price set forth in Exhibit "B" for the Common Area Lot ($49,000) and the Park Lot ($21,000) shall not be increased or decreased by the provisions of paragraph C.7 herein, and payment of the respective Release Price for the Common Area Lot and/or Park Lot shall not be credited against the amounts owing by Mortgagor under the Note; provided, however, that if Mortgagor extends the payment date for the Release Price for the Common Area Lot and/or the Park Lot as herein provided, Mortgagor shall pay to Mortgagee Release Price Interest (as hereinafter defined) in

accordance with paragraph C.7.b hereinbelow calculated on the Release Price for the Common Area Lot and the Park Lot with no shared appreciation adjustment.

7. Release Price. The Release Price for any Lot is equal to the Base Release Price for such Lot as set forth in Exhibit "B", adjusted upwards or downwards based on the difference between the gross sales price to be paid by a third party buyer of such Lot (the "Sales Price") and the appraised value of such Lot as set forth in Exhibit "B" (the "Appraised Value"). The Base Release Price shall be increased by twenty-five percent (25%) of any increment of the Sales Price in excess of the Appraised Value, up to 122.8% of the Appraised Value ("Level A"). The Base Release Price shall be increased by the twenty-five percent (25%) of the increment of Level A plus thirty percent (30%) of any increment of the Sales Price in excess of 122.8% of the Appraised Value, up to 143.2% of the Appraised Value ("Level B"). The Base Release Price shall be increased by the twenty-five percent (25%) of the increment of Level A, plus the thirty percent (30%) of the increment of Level B, plus thirty-five percent (35%) of any

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increment of the Sales Price in excess of 143.2% of the Appraised Value ("Level C"). The Base Release Price shall be decreased by twenty-five percent (25%) of any increment of the Sales Price less than the Appraised Value. However, in no event shall the Release Price be less than $50,000. Any and all proceeds from the sale of the Lots, after payment of the Release Price to Mortgagee, shall belong to Mortgagor.

With respect to the premises described in said Exhibit "A-1" which has yet to be subdivided into individual residential lots, the Base Release Price for said lots upon completion of subdivision shall be equal to $74,333 and the appraised value of said lots shall be equal to $368,083.

a. Example of Calculation of Release Price. Assume that Lot 1 is sold to a third party buyer for $600,000. Exhibit "B" shows that the Appraised Value of Lot 1 is $395,000 and that the Base Release Price is $79,374. The Release Price would be $138,039. Level A (122.8% of the Appraised Value) is equal to $485,060; Level B (143.2% of the Appraised Value) is equal to $565,640; and Level C is any increment of the Sales Price in excess of $565,640. The Sales Price of $600,000 is compared against the various levels established, with the increment of the Sales Price multiplied by the respective percentage for each level. The Sales Price surpasses the upper limit of Level A and therefore the complete increment of the Sales Price for Level A of $90,060 ($485,060 minus $395,000) is multiplied by 25% for an increase in the Base Release Price of $22,515. The Sales Price surpasses the

upper limit of Level B and therefore the complete increment of the Sales Price for Level B of $80,580 ($565,640 minus $485,060) is multiplied by 30% for an increase in the Base Release Price of $24,174. The Sales Price surpasses Level C and therefore the increment of the Sales Price in excess of Level C of $34,360 ($600,000 minus $565,640) is multiplied by 35% for an increase in the Base Release Price of $12,026. The Base Release Price of $79,374 plus the Level A increase of $22,515, plus the Level B increase of $24,174, plus the Level C increase of $12,026 results in a Release Price of $138,089.

Assume that Lot 1 is sold to a third party buyer for $300,000. Exhibit "B" shows that the Appraised Value of Lot 1 is $395,000 and that the Base Release Price is $79,374. The Release Price would be $55,624. As the Sales Price is less than the Appraised Value, the Base Release Price is reduced by 25% of the increment between the Sales Price and the Appraised Value, but in no event to less than $50,000. The increment between the Sales Price and the Appraised Value is $95,000 ($395,000 minus $300,000), which is multiplied by 25% to equal $23,750. The Base Release Price of $79,374 is reduced by $23,750 which results in a Release Price of $55,624.

b. Interest Payments on Release Prices. Mortgagor also agrees to pay to Mortgagee interest ("Release Price Interest") at a rate equal to ten percent (10.0%) per year on each of the Lots which is unsold on April 30, 1995 and as of April 30th of each succeeding year during the term calculated on the sum of the Base

CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

upper limit of Level B and therefore the complete increment of the Sales Price for Level B of $80,580 ($565,640 minus $485,060) is multiplied by 30% for an increase in the Base Release Price of $24,174. The Sales Price surpasses Level C and therefore the increment of the Sales Price in excess of Level C of $34,360 ($600,000 minus $565,640) is multiplied by 35% for an increase in the Base Release Price of $12,026. The Base Release Price of $79,374 plus the Level A increase of $22,515, plus the Level B increase of $24,174, plus the Level C increase of $12,026 results in a Release Price of $138,089.

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b. Interest Payments on Release Prices. Mortgagor also agrees to pay to Mortgagee interest ("Release Price Interest") at a rate equal to ten percent (10.0%) per year on each of the Lots which is unsold on April 30, 1995 and as of April 30th of each succeeding year during the term calculated on the sum of the Base

Release Price for each unsold Lot plus the average shared appreciation amount per Lot as determined by lot sales closed during the preceding twelve (12) month period (May 1 to April 30). If there were no lot sales during the preceding twelve month period then the average shared appreciation amount for the previous twelve month period shall be used. The average shared appreciation amount is determined by taking the total amount paid to Mortgagee from the sale of Lots during the preceding twelve month period less the aggregate total of the Base Release Price on those Lots and dividing that amount by the number of Lots sold during that twelve month period. The term "unsold Lot" as used herein means any Lot which on April 30th has not been released from this Mortgage, and expressly excluding therefrom any Lot (i) listed on Exhibit "C" attached hereto, or (ii) which on April 30th has been released from this Mortgage, or (iii) which on April 30th is subject to a binding Sales Contract executed by Mortgagor (as seller) and deposited into escrow together with the purchaser's initial deposit under the sales contract or (iv) which on April 30th is subject to a binding sales contract executed by Mortgagor (as purchaser pursuant to the provisions of paragraph C.7.c) and deposited into escrow together with Mortgagor's initial deposit under the sales contract. Release Price Interest on unsold Lots shall be calculated on the 1st day of May, 1995, and on May 1st of each year thereafter during the term of this Mortgage and shall be payable to Mortgagee on or before the 1st day of July, 1995, and on or before July 1st of each year thereafter during the term of this Mortgage. For example, if we

assume that on April 30, 1996, Lot 12 remains unsold and the average shared appreciation amount during the preceding twelve month period is $10,000.00 then the Release Price Interest payable to Mortgagee on Lot 12 would be calculated as follows:

a.	Base Release Price - - - - - - - - - -	$88,047
b.	PLUS Average Shared Appreciation Amount - - - - - - - - - -	$10,000
	Subtotal - - - - - - - - - -	$98,047
c.	Subtotal TIMES .10	
d.	EQUALS Release Price Interest - - - - - - - - - -	-$9,804.70

This calculation shall be made for each of the Lots which is unsold as of April 30th, and the aggregate total of the Release Price Interest on each of the unsold Lots is payable to Mortgagee on or before July 1st.

c. Release Price for Individual Lot(s) to be Acquired by Mortgagor. Mortgagor may obtain the release of any and all Lots from the lien of this Mortgage at any time during the term of this Mortgage, subject to the payment by Mortgagor to Mortgagee of a Release Price for each such Lot calculated in accordance with the procedure and formula set forth in paragraph C.7.a. The sales price for the Lot to be used in the calculation of the Release Price shall be set by mutual agreement of the Mortgagee and Mortgagor based on sales of comparable Lots within the last twelve (12) months, or if no sales of Lots have been made within the last twelve (12) months, based on sales of comparable lots in East Honolulu. If the Mortgagee and Mortgagor fail to agree upon the sales price to be used within thirty (30) days after Mortgagor's request to obtain a release of the Lot, then the sales price of the

Lot for purposes of this paragraph shall be determined by the appraisal procedure set forth in paragraph C.1. The appraisers shall set the sales price for the Lot by determining the then fair market value of the Lot. After determination of the sales price, the Release Price for such Lot(s) shall be determined according to the procedure and formula set forth in paragraph C.7.

8. Governmental Approvals and Dedication of Public Improvements. Mortgagee shall, from time to time, join with Mortgagor in executing and recording appropriate documents in connection with the development of the Mortgaged Property, including applications to subdivide the Mortgaged Property, and to obtain necessary permits and governmental approvals. Upon completion of the development and subdivision of the Mortgaged Property as herein provided, the parties hereto will join in dedicating for public use roadway lots and all drainage and other utility improvements to be constructed on the Mortgaged Property by Mortgagor, and any other improvements made for public use on or for the Mortgaged Property and convey to the proper governmental authority or public utility companies any necessary land and easements.

9. Mortgagor'S Right to Extend Term. Mortgagor shall have the right and option to extend the term of the Note and this Mortgage for an additional period of five (5) years from May 1, 1995, to and including April 30, 2000, subject to Mortgagor's compliance with and satisfaction of each of the following conditions:

a. Mortgagor shall have sold at least ninety-seven (97) Lots. The term "sold" as used herein means any Lot (i) listed on Exhibit "C" attached hereto, or (ii) which on April 15, 1995 has been released from this Mortgage, or (iii) which on April 15, 1995 is subject to a binding Sales Contract executed by Mortgagor (as seller) and deposited into escrow together with the purchaser's initial deposit under the sales contract or (iv) which on April 15, 1995 is subject to a binding sales contract executed by Mortgagor (as purchaser pursuant to the provisions of paragraph C.7.c) and deposited into escrow together with Mortgagor's initial deposit under the sales contract.

b. Mortgagor shall give written notice of its exercise of the option to extend to Mortgagee no sooner than February 1, 1995 and no later than April 15, 1995.

c. Mortgagor shall not at the time of the exercise of the option be in default under any provision of the Note or this Mortgage. If Mortgagor fails to exercise the option by April 15, 1995, then all rights of the Mortgagor to an extension shall terminate.

D. Default and Remedies.

1. Events of Default. The occurrence of any one or more of the following shall constitute an Event of Default hereunder:

(A) The Mortgagor shall default in the payment of principal, interest, fees or charges when due on the Note; or

(B) The Mortgagor shall default in the due and punctual observance or performance of any other covenant, agreement, obligation or condition required to be observed and/or performed by the Mortgagor under this Mortgage, and such default, shall not have been remedied within thirty (30) days after the Mortgagee gives notice to Mortgagor, of such default; PROVIDED, HOWEVER, that as to a default which is not susceptible of being remedied within such thirty (30) day period, and provided the Mortgagor commences appropriate action within such thirty (30) days to remedy such default, and diligently pursues cure, such default shall not constitute an Event of Default; ..

(C) Any one or more of the Events of Default defined in the Note shall occur; or

(D) The Mortgagor shall become insolvent or shall admit in writing the Mortgagor's inability to meet the Mortgagor's debts as they become due, or the Mortgagor shall file a voluntary petition in bankruptcy, or make an assignment for the benefit of creditors, or consent to the appointment of a receiver or trustee for all or a substantial part of the Mortgagor's properties, or file a petition, answer or other instrument seeking or acquiescing in the arrangement of the Mortgagor's debts, or other relief under the federal bankruptcy laws or any other applicable law for the relief of debtors of the United States of America or any state or, territory thereof; or

(E) The Mortgagor abandons the Mortgaged Property; or

(F) There shall be any attachment, execution or other judicial seizure of or affecting the Mortgaged Property, or any part thereof, unless the Mortgagor posts a bond or bonds or deposits money in escrow against or otherwise eliminates such attachment, execution or seizure within thirty (30) days of its occurrence.

2. Mortgagee's Remedies. Upon the occurrence of an Event of Default:

(A) The Mortgagee may, without notice, presentment or demand, declare the unpaid adjusted principal amount of the Note and any interest thereon as provided in the Note and all fees, charges and other sums under this Mortgage which are due and unpaid to be immediately due and payable, and such principal amount and interest and such fees, charges and other sums shall thereupon become and be immediately due and payable, and shall thereafter bear interest until fully paid at the rate specified in the Note to be paid in the Event of Default;

(B) The Mortgagor, upon demand of the Mortgagee, shall forthwith surrender to the Mortgagee the actual possession of the Mortgaged Property and, to the extent permitted by law, the Mortgagee itself or such officers or agents as it may appoint:

(i) May enter and take possession of the Mortgaged Property, together with the books, papers and accounts of the Mortgagor relating thereto;

(ii) May exclude the Mortgagor, its agents and servants therefrom;

(iii) May hold, operate and manage the same and from time to time make all needful repairs and such alterations, additions, advances and improvements as the Mortgagee shall deem appropriate; and

(iv) May receive tolls, rents, revenues, issues, income, product and profits thereof and out of the same may pay all proper costs and expenses of so taking, holding and managing the same, including reasonable compensation to the Mortgagee's agents, attorneys and counsel, and any taxes and assessments and other charges prior to the lien and security interest of this Mortgage, which the Mortgagee shall deem necessary or desirable to pay, and all expenses of such repairs, alterations, additions and improvements, and other disbursements made by the Mortgagee pursuant to the terms hereof, and may apply the remainder of the monies so received by the Mortgagee to the payment of any sums secured hereby, including, but not limited to, the unpaid adjusted principal of, and interest on, the Note;

(C) The Mortgagee may, to the extent permitted by law, with or without first taking possession, sell the Mortgaged Property, in whole or, to the extent permitted by law, in part, at public auction in the State of Hawaii, or at such place as may be required by law, having first given notice of such sale by publication as may be required by law, and may adjourn such sale from time to time by announcement at, the time and place appointed

for such sale or adjourned sale, and upon such sale, the Mortgagee may make and deliver to any purchaser a good and sufficient deed or bill of sale, and good and sufficient receipts for the purchase money, and do and perform all other acts as may be necessary fully to carry into effect this power of sale;

(D) The Mortgagee may, either with or without first taking possession, proceed by action or actions; at law or in equity, or by any other appropriate remedy, to enforce payment of the Note or performance of any other covenant, agreement, obligation or condition secured hereby, and to foreclose this Mortgage, and to sell, in whole, or to the extent permitted by law, in part, the Mortgaged Property under the judgment or decree of a court or courts of competent jurisdiction; provided, however, that neither the Mortgagee nor any commissioner appointed in any action to enforce this Mortgage shall be obligated to sell the Mortgaged Property other than in whole;

(E) Upon the institution of judicial proceedings to enforce its rights hereunder, the Mortgagee, to the extent permitted by law, shall be entitled as a matter of right to the ex parte appointment (without bond) of a receiver or receivers of the Mortgaged Property and of the total rents, revenues, issues, income, product and profits thereof, pending such proceedings, with such powers as the court making such appointment shall confer; and

(F) The Mortgagee shall have the right; to enforce one or more remedies hereunder, or any other remedy the Mortgagee may have under the other Loan Documents, successively or concurrently,

including, but not limited to, the right to foreclose this Mortgage with respect to any portion of the Mortgaged Property, if the operation of the remaining portion thereof is not thereby rendered unlawful under the then applicable laws, rules and regulations of the governmental authorities having jurisdiction in the premises, without thereby impairing the lien or security interest of this Mortgage on the remainder of the Mortgaged Property or affecting the remedies of the Mortgagee available with respect thereto.

Upon any sale, either under the power of sale hereby given or under judgment or decree in any judicial proceedings for foreclosure, or otherwise for enforcement of this Mortgage, the unpaid principal amount of the Note (adjusted upon the Event of Default as provided in the Note), the unpaid interest thereon, and all other obligations hereby secured, if not previously due, shall at once become and be immediately due and payable.

Upon any such sale, the Mortgagee may bid for and purchase the Mortgaged Property or any part thereof, and, upon compliance with the terms of sale, may hold, retain and possess and dispose of such property in its absolute right without further accountability, and, in paying purchase money at any such sale, if permitted by law, after allowing for the proportion of the total purchase price required to be paid in cash for the costs and expenses of the sale, commissioner's compensation and other charges, the Mortgagee shall be entitled to apply as a credit against the purchase price, in lieu of cash, all amounts owing by the Mortgagor under the Note and/or this Mortgage, to the extent

required. The Mortgagee shall be permitted to bid at any public auction held to sell the Mortgaged Property without payment of a deposit or down payment of any kind. The Mortgagee shall not be required at confirmation of any public auction sale to extend credit or financing of any kind to the Mortgagor or any other party that may acquire the Mortgaged Property.

The Mortgagee may apply the proceeds of any such sale, in such order as the Mortgagee shall determine, to (i) the costs and expenses of such sale and all proceedings in connection therewith, including, but not limited to, counsel fees; (ii) to the payment of any unreimbursed disbursements made by the Mortgagee for taxes or assessments or other charges prior to the lien and security interest of this Mortgage; (iii) to the payment of all other unreimbursed disbursements and expenses and unpaid charges and fees due and owing to the Mortgagee under the provisions of this Mortgage; and (iv) to the payment of the unpaid principal (as adjusted in the Event of Default pursuant to the provisions of the Note) and interest on the Note; and the remainder, if any, shall be paid over to the Mortgagor.

Any such sale shall, to the extent permitted by law, be a perpetual bar, both at law and in equity, against the Mortgagor and all persons and corporations lawfully claiming by or through or under the Mortgagor; and the Mortgagee is hereby irrevocably appointed the true and lawful attorney of the Mortgagor, in the Mortgagor's name and stead, for the purpose of effectuating any such sale, to execute and deliver all necessary deeds, conveyances,

assignments, bills of sale and other instruments with power to substitute one or more persons or corporations with like power; provided, that the Mortgagor shall ratify and confirm any such sale or transfer if required by the Mortgagee by delivering all proper conveyances or other instruments to such persons or corporations as may be designated in any such request.

In case of any Event of Default, neither the Mortgagor nor anyone claiming by, through or under the Mortgagor, to the extent the Mortgagor may lawfully so agree, shall or will set up, claim or seek to take advantage of any appraisement, valuation, stay, extension or redemption laws now or hereafter in force in any locality where any of the Mortgaged Property is situated, in order to prevent or hinder the enforcement or foreclosure of this Mortgage, or the absolute sale of the Mortgaged Property, or the final and absolute putting into possession thereof, immediately after such sale, of the purchasers thereof; and the Mortgagor, for the Mortgagor and all who may claim under the Mortgagor, hereby waives, to the full extent that the Mortgagor may lawfully so do, the benefit of all such laws, and any and all right to have the estate comprised in the security intended to be created hereby marshalled upon any foreclosure of the lien and security interest hereof, and agrees that the Mortgagee or any court having jurisdiction to foreclose such lien and security interest may sell the Mortgaged Property as an entirety.

In case the Mortgagee shall have proceeded to enforce any right hereunder and such proceedings shall have been discontinued

CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

assignments, bills of sale and other instruments with power to substitute one or more persons or corporations with like power; provided, that the Mortgagor shall ratify and confirm any such sale or transfer if required by the Mortgagee by delivering all proper conveyances or other instruments to such persons or corporations as may be designated in any such request.

In case of any Event of Default, neither the Mortgagor nor anyone claiming by, through or under the Mortgagor, to the extent the Mortgagor may lawfully so agree, shall or will set up, claim or seek to take advantage of any appraisement, valuation, stay, extension or redemption laws now or hereafter in force in any locality where any of the Mortgaged Property is situated, in order to prevent or hinder the enforcement or foreclosure of this Mortgage, or the absolute sale of the Mortgaged Property, or the final and absolute putting into possession thereof, immediately after such sale, of the purchasers thereof; and the Mortgagor, for the Mortgagor and all who may claim under the Mortgagor, hereby waives, to the full extent that the Mortgagor may lawfully so do, the benefit of all such laws, and any and all right to have the estate comprised in the security intended to be created hereby marshalled upon any foreclosure of the lien and security interest hereof, and agrees that the Mortgagee or any court having jurisdiction to foreclose such lien and security interest may sell the Mortgaged Property as an entirety.

In case the Mortgagee shall have proceeded to enforce any right hereunder and such proceedings shall have been discontinued

or abandoned for any reason, then in every such case, the Mortgagor and the Mortgagee shall be restored to their former positions and rights hereunder with respect to the Mortgaged Property, and all rights, remedies and powers of the Mortgagee shall continue as if no such proceedings had been taken. No remedy herein reserved to the Mortgagee is intended to be exclusive of any other remedy, but each and every such remedy shall be cumulative and shall be in addition to any other remedy given hereunder or now or hereafter existing at law or in equity, or by statute.

3. Nonrecourse. It is understood that Mortgagor shall have no personal liability for failure to perform its obligations hereunder and under the Note, and the only recourse of the Mortgagee shall be to realize on the Mortgaged Property for the payment of the Note. No deficiency judgment shall be sought or obtained against Mortgagor, its successors or assigns for any balance of the indebtedness evidenced by the Note which may remain unpaid after exhaustion of the Mortgaged Property; and no judgment rendered on the Note, or on the Mortgage shall be a lien upon or be executed against any real estate or personal property of Mortgagor, its successors or assigns, other than the Mortgaged Property.

E. Miscellaneous Provisions.

1. No Waiver. Any failure by the Mortgagee to insist upon the strict performance by the Mortgagor of any of the covenants, agreements, obligations or conditions hereof shall not be deemed to be a waiver of any of such covenants, agreements, obligations or conditions, and the Mortgagee, notwithstanding any

such failure, shall have the right thereafter to insist upon the strict performance by the Mortgagor of any and all of such covenants, agreements, obligations and conditions.

2. Consent and Approval. Whenever Mortgagee's or Mortgagor's consent or approval is required hereunder, such consent will not be unreasonably or arbitrarily delayed or withheld nor shall the consenting party require the payment of monies or other consideration therefor, except as specifically provided herein.

3. Notices. Any notice or demand to Mortgagee or Mortgagor provided for or permitted by this Mortgage may be given sufficiently for all purposes in writing mailed as registered or certified mail, addressed to such party at its post office address herein specified or the last such address designated by such party in writing to the other, or delivered personally within the State of Hawaii to any one of the Mortgagee or Mortgagor or any officer of Mortgagor if Mortgagor is a corporation or any general partner of Mortgagor if Mortgagor is a partnership, as the case may be, and shall be deemed conclusively to have been given on the date of such mailing or personal delivery.

4. Integration and Amendment. This Mortgage and the Note secured hereby is a complete integration of every agreement and representation made by or on behalf of Mortgagee and Mortgagor with respect to the Mortgaged Property and no implied covenant or prior oral or written agreement shall be held to vary the provisions hereof, any law or custom to the contrary notwithstanding. No amendment or modification of this Mortgage

shall be effective unless incorporated in a written instrument executed by Mortgagee and Mortgagor.

5. No Partnership Intended. Mortgagee and Mortgagor agree that Mortgagee in no event and for no purpose are partners of Mortgagor in the conduct of any of its businesses or other affairs or joint ventures or members of a joint enterprise with Mortgagor.

6. Definitions. The term "Mortgaged Property" herein shall be deemed or taken to include (except where such meaning would be clearly repugnant to the context) all buildings and other improvements now or any time hereafter built on the Mortgaged Property. The term "Mortgagee" herein shall mean and include Mortgagee, their successors in trust and assigns, and the term "Mortgagor" herein or any pronoun used in place thereof shall mean and include the masculine or feminine, the singular or plural number, and jointly and severally individuals, firms or corporations, and their and each of their respective heirs, successors, personal representatives and permitted assigns, according to the context hereof. The headings of paragraphs herein are inserted only for convenience and reference and shall in no way define, expand or limit the scope or intent of any provision of this Mortgage.

7. Applicable Laws. This Mortgage shall be governed by and shall be construed and interpreted under and pursuant to the laws of the State of Hawaii. If any provision of this Mortgage is held to be invalid or unenforceable, such will not affect the

validity or enforceability of the other provisions of this Mortgage.

IN WITNESS WHEREOF, the Mortgagor and the Mortgagee have executed these presents as of the day and year first.

Henry Haalilio Peters

Oswald Kofoad Stender

William Shaw Richardson
Trustees of the Estate of
Bernice Pauahi Bishop

HAWAII KAI DEVELOPMENT COMPANY

Approved as to form
10-21-91

By
Its Vice President

ATTACHMENTS:

Exhibit A	Legal Description
Exhibit A-1	Additional Property
Exhibit B	Release Price Schedule
Exhibit C	Sold Lots

APPROVED AS TO FORM
AND CONTENT
McCORRISTON MIHO & MILLER
By D. Scott MacLennan

STATE OF HAWAII)
) SS
CITY AND COUNTY OF HONOLULU)

On this 21st day of October, 1991, before me personally appeared Steve Silla, to me personally known, who, being by me duly sworn, did say that (s)he is the Vice President of HAWAII KAI DEVELOPMENT COMPANY, the corporation named in the foregoing instrument, and that the seal affixed to said instrument is the corporate seal of said corporation and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors, and said officer acknowledged said instrument to be the free act and deed of said corporation.

Judy Steinbeck

NOTARY PUBLIC, State of Hawaii

My commission expires: 1/3/92

STATE OF HAWAII)
) SS
CITY AND COUNTY OF HONOLULU)

On this 14th day of October, 1991, before me personally appeared Henry Haalilio Peters, Oswald Kofoad Stender, and William Shaw Richardson, three of the Trustees of the Estate of Bernice Pauahi Bishop, to me known to be the persons described in and who severally executed the foregoing instrument, and severally acknowledged that they executed the same as their free act and deed as such Trustees.

LESLIE M. YAMASHITA
Notary Public, State of Hawaii
My commission expires Sept. 27, 1992

NOTARY PUBLIC, State of Hawaii

My commission expires:

EXHIBIT A

LEGAL DESCRIPTION OF PROPERTY

FIRST:

All of those certain parcels of land (being a portion of R. P. 4475, L. C. Aw. 7713, Apana 30 to V. Kamamalu), situate at Maunalua, Honolulu, City and County of Honolulu, State of Hawaii, containing a total area of 719,439 square feet and described as follows:

Lots 1 through 5, 7, 20, 23, 28, 30, 32, 36, 42 through 44, 48, 50 through 54, 56, 58, 59, 62, 63, Roadway Lots 64 through 67, Private Park Site Lot 38 and Common Area Lot 37, as delineated on the map entitled "Kamehame Ridge Subdivision, Unit II - Phase I," filed in the Bureau of Conveyances of the State of Hawaii as File Plan No. 1998.

SECOND:

All of those certain parcels of land (being a portion of R. P. 4475, L. C. Aw. 7713, Apana 30 to V. Kamamalu), situate at Maunalua, Honolulu, City and County of Honolulu, State of Hawaii, containing a total area of 47,882 square feet and described as follows:

Lots 1, 2 and 3 as delineated on the map entitled "Kamehame Ridge Subdivision, Unit II - Phase IA," filed in the Bureau of Conveyances of the State of Hawaii as File Plan No. 2035.

THIRD:

EASEMENT A (56-FT. WIDE) FOR ROADWAY AND UTILITY PURPOSES

Being a portion of Lot 68, being also a portion of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu, situated at Maunalua, Honolulu, Oahu, Hawaii.

Beginning at the Southwest corner of this easement and at the Northwest end of Kamehame Drive, the coordinates of said point of beginning referred to Government Survey Triangulation Station ("KOKO HEAD 3" being 13,744.59 feet North and 8,104.33 feet East, thence running by azimuths measured clockwise from True South:

1. Along the remainder of Lot 68, along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu on a curve to the left with a radius of 672.00 feet, the azimuth and distance of the chord being:

163° 55' 26" 137.93 feet;

2. 158° 02' 149.65 feet along the remainder of Lot 68, along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

3. Thence along the remainder of Lot 68, along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu on a curve to the right with a radius of 328.00 feet, the azimuth and distance of the chord being:

183° 13' 279.14 feet;

4. 208° 24' 822.73 feet along the remainder of Lot 68, along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

5. Thence along the remainder of Lot 68, along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu on a curve to the left with a radius of 472.00 feet, the azimuth and distance of the chord being:

195° 38' 30" 208.47 feet;

6. 182° 53' 729.46 feet along the remainder of Lot 68, along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

7. Thence along the remainder of Lot 68, along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu on a curve to the left with a radius of 772.00 feet, the azimuth and distance of the chord being:

181° 57' 05" 25.11 feet;

8. 271° 01' 10" 56.00 feet along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

9. Thence along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu on a curve to the right with a radius of 828.00 feet, the azimuth and distance of the chord being:

1° 57' 05" 26.93 feet;

10. 2° 53' 729.46 feet along the remainder of Lot 68, along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

11. Thence along the remainder of Lot 68, along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu on a curve to the right with a radius of 528.00 feet, the azimuth and distance of the chord being:

15° 38' 30" 233.21 feet;

12. 28° 24' 822.73 feet along the remainder of Lot 68, along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

13. Thence along the remainder of Lot 68, along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu on a curve to the left with a radius of 272.00 feet, the azimuth and distance of the chord being:

3° 13' 231.48 feet;

14. 338° 02' 149.65 feet along the remainder of Lot 68, along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

15. Thence along the remainder of Lot 68, along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu on a curve to the right with a radius of 728.00 feet, the azimuth and distance of the chord being:

343° 55' 26" 149.43 feet;

16. 79° 48' 52" 56.00 feet along the North end of Kamehame Drive to the point of beginning and containing an area of 132,059 square feet.

FOURTH:

EASEMENT B (26-FT. WIDE) FOR ROADWAY AND UTILITY PURPOSES

Being a portion of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu, situated at Maunalua, Honolulu, Oahu, Hawaii.

Beginning at the Southwest corner of this easement, the coordinates of said point of beginning referred to Government Survey Triangulation Station "KOKO HEAD 3" being 15,972.62 feet North and 8,516.88 feet East, thence running by azimuths measured clockwise from True South:

1. Along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu on a curve to the left with a radius of 778.00 feet, the azimuth and distance of the chord being:

179° 15' 35" 47.78 feet;

2. 177° 30' 413.27 feet along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

3. Thence along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu and along the Reservoir Lot on a curve to the right with a radius of 272.00 feet, the azimuth and distance of the chord being:

208° 15' 278.14 feet;

4. 239° 00' 44.06 feet along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

5. Thence along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu on a curve to the left with a radius of 228.00 feet, the azimuth and distance of the chord being:

227° 18' 30" 92.41 feet;

6. 215° 37' 53.16 feet along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

7. 305° 37' 26.00 feet along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

8. 35° 37' 53.16 feet along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

9. Thence along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu on a curve to the right with a radius of 254.00 feet, the azimuth and distance of the chord being:

47° 18' 30" 102.94 feet;

10. 59° 00' 44.06 feet along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

11. Thence along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu on a curve to the left with a radius of 246.00 feet, the azimuth and distance of the chord being:

28° 15' 251.56 feet;

12. 357° 30' 413.27 feet along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

13. Thence along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu on a curve to the right with a radius of 804.00 feet, the azimuth and distance of the chord being:

359° 15' 35" 49.38 feet;

14. 91° 01' 10" 26.00 feet along the remainder of Lot 68, along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu to the point of beginning and containing an area of 24,321 square feet.

FIFTH:

RESERVOIR LOT

Being a portion of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu, situated at Maunalua, Honolulu, Oahu, Hawaii.

Beginning at the Northwest corner of this piece of land, the coordinates of said point of beginning referred to Government Survey Triangulation Station "KOKO HEAD 3" being 16,608.67 feet North and 8,404.53 feet East, thence running by azimuths measured clockwise from True South:

1. 252° 20' 100.90 feet along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

2. 272° 00' 39.59 feet along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

3. 310° 00' 27.92 feet along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;

4. Thence along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu on a curve to the left with a radius of 272.00 feet, the azimuth and distance of the chord being:

24° 39' 50" 143.88 feet;

5.	92°	00'	101.17 feet	along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu;
6.	182°	00'	116.00 feet	along the remainder of R. P. 4475, L. C. Aw. 7713, Ap. 30 to V. Kamamalu to the point of beginning and containing an area of 17,070 square feet.

SIXTH:

All of those certain parcels of land (being a portion of R. P. 4475, L. C. Aw. 7713, Apana 30 to V. Kamamalu), situate at Maunalua, Honolulu, City and County of Honolulu, State of Hawaii, containing a total area of 1,101,562 square feet and described as follows:

Lots 1 through 69, and 71 through 76, as delineated on the map entitled "Kamehame Ridge Subdivision, Unit II - Phase II-A," filed in the Bureau of Conveyances of the State of Hawaii a File Plan No. 2028.

SEVENTH:

All of those certain parcels of land (being a portion of R. P. 4475, L. C. Aw. 7713, Apana 30 to V. Kamamalu), situate at Maunalua, Honolulu, City and County of Honolulu, State of Hawaii, containing a total area of 899,862 square feet and described as follows:

Lots 1 through 64, as delineated on the map entitled "Kamehame Ridge Subdivision, Unit II - Phase II-B," filed in the Bureau of Conveyances of the State of Hawaii as File Plan No. 203

END OF EXHIBIT "A"

EXHIBIT A-1

LEGAL DESCRIPTION OF PROPERTY

KAMEHAME RIDGE SUBDIVISION UNIT III

Being a portion of R.P. 4475, L.C. Aw. 7713, Ap. 30 to V. Kamamalu

Situated at Maunalua, Honolulu, Oahu, Hawaii

Beginning at the Southeast corner of this piece of land, being also the Northeast corner of Lot 35 of Kamehame Ridge Subdivision Unit II, Phase II-B (File Plan 2033), the coordinates of said point of beginning referred to Government Survey Triangulation Station "KOKO HEAD 3" being 15,709.35 feet North and 8,767.65 feet East, thence running by azimuths measured clockwise from True South:

1.	92° 53'	100.52 feet	along Lot 35 ofKamehame Ridge Subdivision Unit II, Phase II-B (File Plan 2033);
2.	182° 53'	91.00 feet	along Lot 36 of Kamehame Ridge Subdivision Unit II, Phase II-B (File Plan 2033);
3.	92° 53'	112.76 feet	along Lot 36 of Kamehame Ridge Subdivision Unit II, Phase II-B (File Plan 2033);
4.	182° 53'	77.59 feet	along the Easterly side of Kamehame Drive;
5.	Thence along the Easterly side of Kamehame Drive on a curve to the right with a radius of 20.00 feet, the azimuth and distance of the chord being:		
	227° 53'	28.28 feet;	

6. 182° 53' 44.00 feet along the Easterly side of Kamehame Drive;

7. Thence along the Easterly side of Kamehame Drive on a curve to the right with a radius of 20.00 feet, the azimuth and distance of the chord being:

136° 57' 05" 27.82 feet;

8. 91° 01' 10" 56.00 feet along the Northerly end of Kamehame Drive;

9. Thence along the Westerly side of Kamehame Drive on a curve to the right with a radius of 772.00 feet, the azimuth and distance of the chord being:

1° 47' 05" 20.62 feet;

10. 92° 53' 169.05 feet along Lot 43 of Kamehame Ridge Subdivision Unit II-Phase II-A (File Plan 2028);

11. 210° 04' 85.99 feet along the remainder of R.P. 4475, L.C. Aw. 7713, Ap. 30 to V. Kamamalu;

12. 182° 00' 742.00 feet along the remainder of R.P. 4475, L.C. Aw. 7713, Ap. 30 to V. Kamamalu;

13. 202° 42' 530.00 feet along the remainder of R.P. 4475, L.C. Aw. 7713, Ap. 30 to V. Kamamalu;

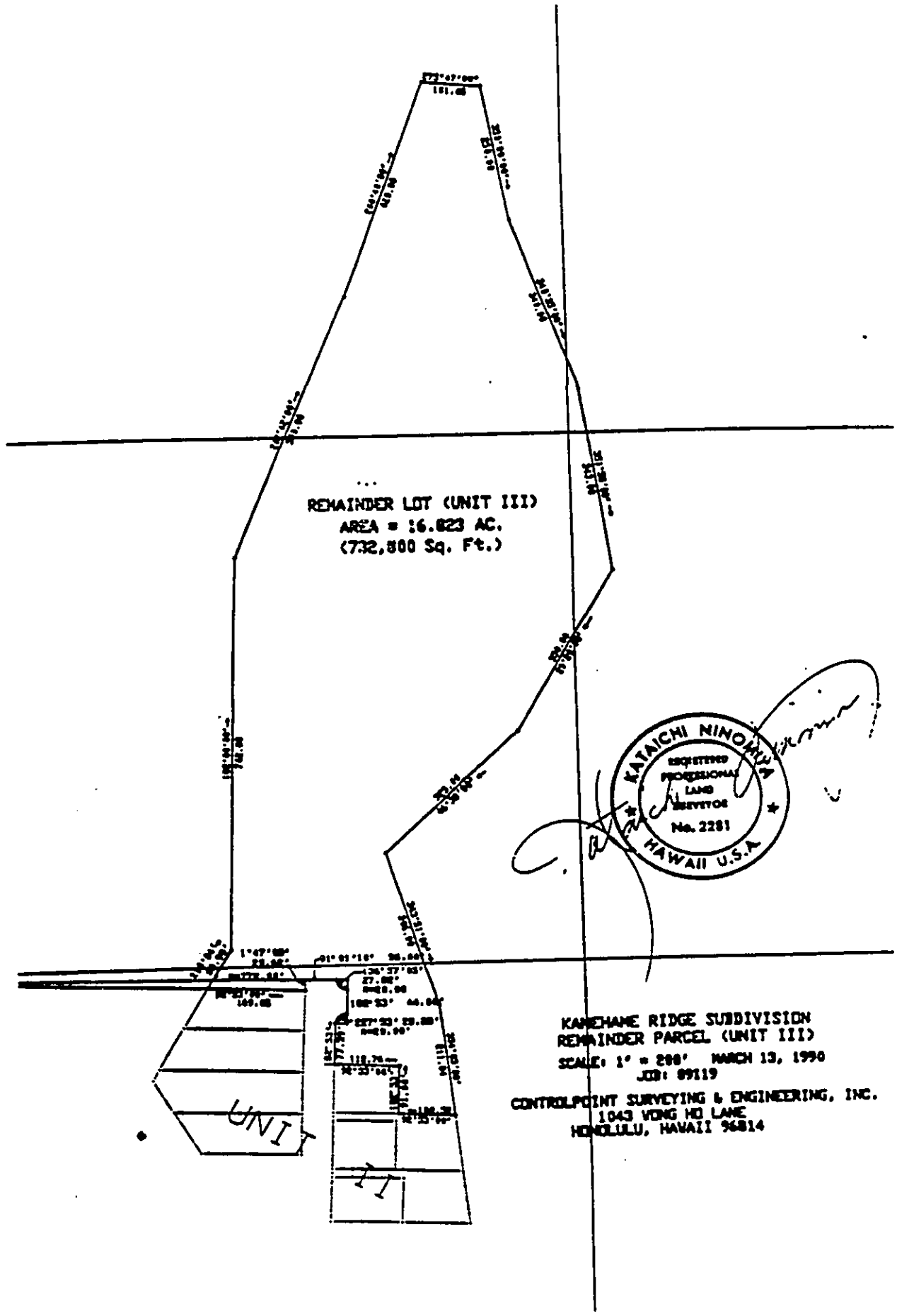
14. 200° 40' 420.00 feet along the remainder of R.P. 4475, L.C. Aw. 7713, Ap. 30 to V. Kamamalu;

15. 275° 47' 101.05 feet along the remainder of R.P. 4475, L.C. Aw. 7713, Ap. 30 to V. Kamamalu;

16. 350° 00' 250.00 feet along the remainder of R.P. 4475, L.C. Aw. 7713, Ap. 30 to V. Kamamalu;

17. 340° 35'	340.00 feet	along the remainder of R.P. 4475, L.C. Aw. 7713, Ap. 30 to V. Kamamalu;
18. 351° 58'	343.00 feet	along the remainder of R.P. 4475, L.C. Aw. 7713, Ap. 30 to V. Kamamalu;
19. 29° 20'	350.00 feet	along the remainder of R.P. 4475, L.C. Aw. 7713, Ap. 30 to V. Kamamalu;
20. 46° 33'	325.00 feet	along the remainder of R.P. 4475, L.C. Aw. 7713, Ap. 30 to V. Kamamalu;
21. 343° 51'	306.00 feet	along the remainder of R.P. 4475, L.C. Aw. 7713, Ap. 30 to V. Kamamalu;
22. 354° 03'	211.04 feet	along the remainder of R.P. 4475, L.C. Aw. 7713, Ap. 30 to V. Kamamalu to the point of beginning and containing an area of 16.823 acres.

END OF EXHIBIT A-1



KANEHAME RIDGE SUBDIVISION
REMAINDER PARCEL (UNIT III)

SCALE: 1" = 200' MARCH 13, 1990
JOB: 89119

CONTROLPOINT SURVEYING & ENGINEERING, INC.
1043 WONG HO LANE
HONOLULU, HAWAII 96814

EXHIBIT B

Lot Number	Phase	Appraised Value	Base Release Price
1	I	$395,000	$79,374
2	I	380,000	76,360
3	I	370,000	74,351
4	I	370,000	74,351
5	I	350,000	70,332
7	I	315,000	63,298
20	I	300,000	60,284
23	I	405,000	81,384
28	I	495,000	99,469
30	I	485,000	97,460
32	I	440,000	88,417
36	I	450,000	90,426
37*	I	N/A	41,000
38**	I	N/A	29,000
42	I	360,000	72,341
43	I	370,000	74,351
44	I	380,000	76,360
48	I	325,000	65,308
50	I	370,000	74,351
51	I	450,000	90,426
52	I	450,000	90,426
53	I	415,000	83,393
54	I	405,000	81,384
56	I	440,000	88,417
58	I	450,000	90,426
59	I	440,000	88,417
62	I	315,000	63,298
63	I	315,000	63,298
64***	I	-0-	-0-
65***	I	-0-	-0-
66***	I	-0-	-0-
67***	I	-0-	-0-
Reservoir Lot		-0-	-0-
1	IA	380,000	76,360
2	IA	380,000	76,360
3	IA	360,000	72,341
1	IIA	$290,000	$58,698
2	IIA	290,000	58,698
3	IIA	325,000	65,782

* Common Area Lot
** Park Site Lot
*** Roadway Lots

Lot Number	Phase	Appraised Value	Base Release Price
4	IIA	$345,000	$69,830
5	IIA	370,000	74,890
6	IIA	490,000	99,179
7	IIA	470,000	95,131
8	IIA	470,000	95,131
9	IIA	345,000	69,830
10	IIA	290,000	58,698
11	IIA	360,000	72,866
12	IIA	370,000	74,890
13	IIA	290,000	58,698
14	IIA	370,000	74,890
15	IIA	415,000	83,999
16	IIA	415,000	83,999
17	IIA	335,000	67,806
18	IIA	415,000	83,999
19	IIA	415,000	83,999
20	IIA	415,000	83,999
21	IIA	390,000	78,939
22	IIA	435,000	88,047
23	IIA	445,000	90,071
24	IIA	345,000	69,830
25	IIA	425,000	86,023
26	IIA	415,000	83,999
27	IIA	345,000	69,830
28	IIA	345,000	69,830
29	IIA	470,000	95,131
30	IIA	480,000	97,155
31	IIA	335,000	67,806
32	IIA	425,000	86,023
33	IIA	360,000	72,866
34	IIA	390,000	78,939
35	IIA	380,000	76,915
36	IIA	360,000	72,866
37	IIA	360,000	72,866
38	IIA	390,000	78,939
39	IIA	405,000	81,975
40	IIA	425,000	86,023
41	IIA	480,000	97,155
42	IIA	480,000	97,155
43	IIA	470,000	95,131
44	IIA	360,000	72,866
45	IIA	335,000	67,806
46	IIA	380,000	76,915
47	IIA	370,000	74,890
48	IIA	335,000	67,806
49	IIA	325,000	65,782
50	IIA	305,000	61,734

Lot Number	Phase	Appraised Value	Base Release Price
51	IIA	$345,000	$69,830
52	IIA	290,000	58,698
53	IIA	305,000	61,734
54	IIA	290,000	58,698
55	IIA	305,000	61,734
56	IIA	290,000	58,698
57	IIA	305,000	61,734
58	IIA	415,000	83,999
59	IIA	415,000	83,999
60	IIA	425,000	86,023
61	IIA	415,000	83,999
62	IIA	315,000	63,758
63	IIA	335,000	67,806
64	IIA	370,000	74,890
65	IIA	305,000	61,734
66	IIA	270,000	54,650
67	IIA	260,000	52,626
68	IIA	260,000	52,626
69	IIA	315,000	63,758
71	IIA	305,000	61,734
72***	IIA	-0-	-0-
73***	IIA	-0-	-0-
74***	IIA	-0-	-0-
75***	IIA	-0-	-0-
76***	IIA	-0-	-0-
1	IIB	380,000	76,915
2	IIB	415,000	83,999
3	IIB	390,000	78,939
4	IIB	390,000	78,939
5	IIB	390,000	78,939
6	IIB	390,000	78,939
7	IIB	380,000	76,915
8	IIB	380,000	76,915
9	IIB	390,000	78,939
10	IIB	470,000	95,131
11	IIB	405,000	81,975
12	IIB	435,000	88,047
13	IIB	370,000	74,890
14	IIB	345,000	69,830
15	IIB	345,000	69,830
16	IIB	305,000	61,734
17	IIB	345,000	69,830
18	IIB	325,000	65,782

Lot Number	Phase	Appraised Value	Base Release Price
19	IIB	$315,000	$63,758
20	IIB	325,000	65,782
21	IIB	335,000	67,806
22	IIB	315,000	63,758
23	IIB	305,000	61,734
24	IIB	260,000	52,626
25	IIB	280,000	56,674
26	IIB	280,000	56,674
27	IIB	325,000	65,782
28	IIB	405,000	81,975
29	IIB	370,000	74,890
30	IIB	345,000	69,830
31	IIB	425,000	86,023
32	IIB	345,000	69,830
33	IIB	405,000	81,975
34	IIB	360,000	72,866
35	IIB	415,000	83,999
36	IIB	360,000	72,866
37	IIB	445,000	90,071
38	IIB	370,000	74,890
39	IIB	315,000	63,758
40	IIB	325,000	65,782
41	IIB	315,000	63,758
42	IIB	345,000	69,830
43	IIB	425,000	86,023
44	IIB	405,000	81,975
45	IIB	405,000	81,975
46	IIB	390,000	78,939
47	IIB	360,000	72,866
48	IIB	345,000	69,830
49	IIB	260,000	52,626
50	IIB	260,000	52,626
51	IIB	415,000	83,999
52	IIB	415,000	83,999
53	IIB	415,000	83,999
54	IIB	425,000	86,023
55	IIB	370,000	74,890
56	IIB	405,000	81,975
57	IIB	470,000	95,131
58	IIB	445,000	90,071
59	IIB	435,000	88,047
60	IIB	335,000	67,806
61	IIB	445,000	90,071
62***	IIB	-0-	-0-
63***	IIB	-0-	-0-
64***	IIB	-0-	-0-

APPROVED AS TO FORM AND CONTENT
McCORMICK, MIHO & MILLER
By

END OF EXHIBIT B

4215G/kp

EXHIBIT C

LOT NUMBER	PHASE
6	I
8	I
9	I
10	I
11	I
12	I
13	I
14	I
15	I
16	I
17	I
18	I
19	I
21	I
22	I
24	I
25	I
26	I
27	I
29	I
31	I
33	I
34	I
35	I
45	I
46	I
47	I
49	I
55	I
57	I
60	I
61	I
70	IIA

APPROVED AS TO FORM
AND CONTENT
McCORMICK MIHO & MILLER
By D. Scott Miller

4225G2/kp